The IRON AGE
December 26, 1957 A Chilton Publication The National Metalworking Weekly

Reds Move Up In World Steel Race P. 19

ALLOY 815-R: A new iron-chromium-aluminum alloy developed especially for use on precision resistor applications. Possesses high resistivity and low temperature coefficient of resistance, plus high strength, excellent ductility, and stability over a wide temperature range.

CHROMEL-C: A 60-16 nickel-chromium-iron alloy widely used in small heating appliances and cold resistors where high resistances are required within limited space. Its stability and uniformity minimize design variables, permit more efficient production of better units at lower cost.

CHROMEL-ALUMEL: The most accurate and most durable base metal thermocouple alloys ever developed. Made exclusively by Hoskins, they are the accepted standards for controlling heat treating operations up to 2300°F. and for measuring temperatures of jet aircraft engines.

ALLOY 46: A gas-free nickel-iron alloy developed especially for use as a terminal material for power resistor units. It is readily "wetted" by enamel to produce a good bond, and its coefficient of expansion is very similar to that of enamels used for such applications.

CHROMEL-D: A time proven low nickel heating element alloy for controlled atmosphere furnace applications. Highly resistant to sulphur attack and preferential intergranular oxidation, it gives long-life service in the critical temperature range between 1500° and 1800°F.

Hoskins

Custom-Quality

ALLOYS

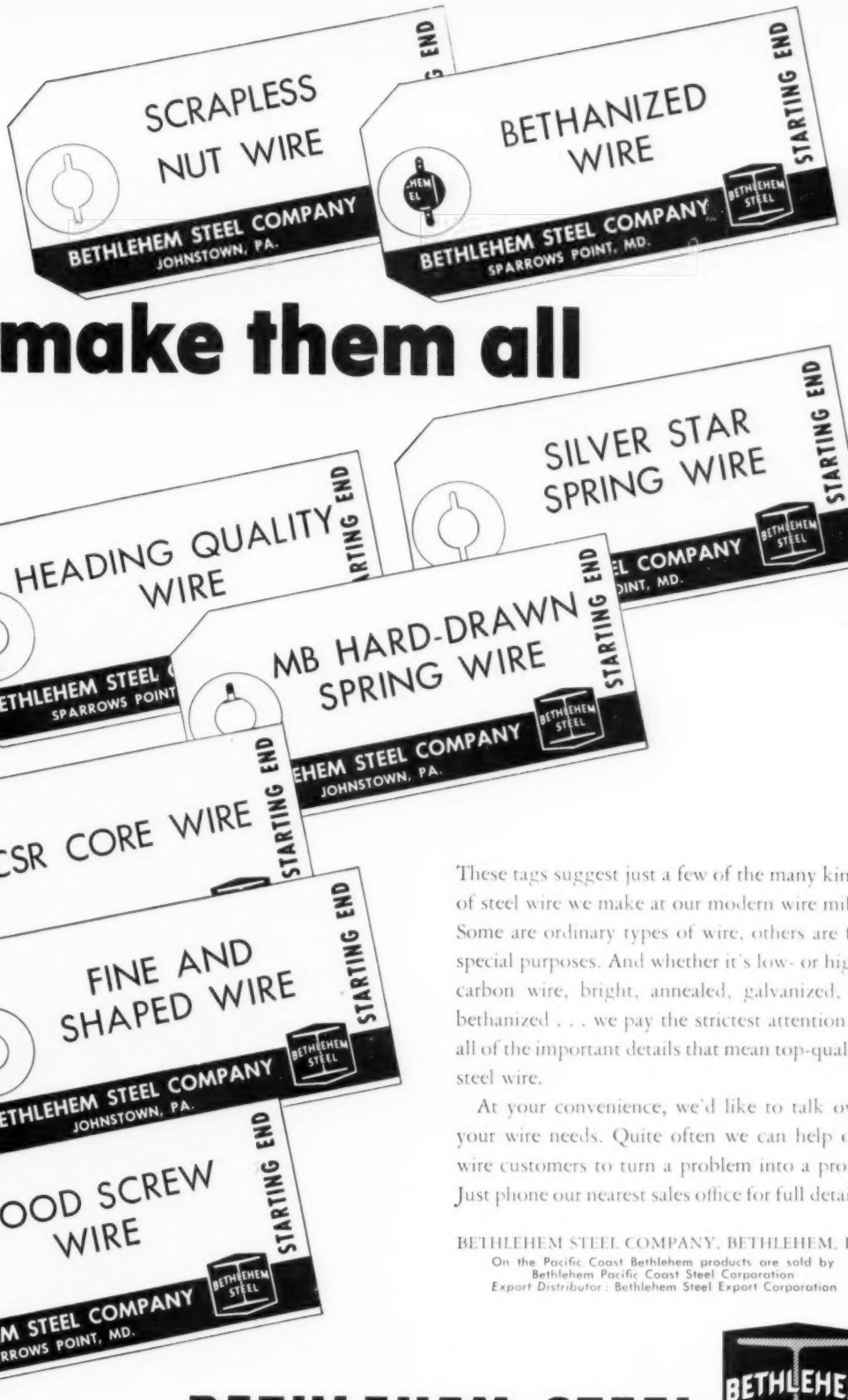
Wire, ribbon, rod and strip for electrical resistance, thermo-electric and mechanical-purpose applications

When it comes to developing and producing custom quality alloys for electrical resistance, thermo-electric, and specialized mechanical purpose applications, you'll find that Hoskins has what it takes to meet your most critical requirements. Complete metallurgical research and development facilities, for one thing. Modern melting and processing equipment, for another. More important, though, is an abundance of human talent . . . people who have the experience, the know-how, and a sincere desire to deliver exactly what you want when and where you want it. *Try them and see!*

Life in a Vacuum—The special vacuum atmosphere life-test equipment shown above was designed and built by Hoskins for use in developing new heating element alloys which will give improved performance and dependable, long-life service in vacuum atmosphere heat treating equipment.

HOSKINS MANUFACTURING COMPANY

4445 Lawton Avenue • Detroit 8, Michigan



We make them all

These tags suggest just a few of the many kinds of steel wire we make at our modern wire mills. Some are ordinary types of wire, others are for special purposes. And whether it's low- or high-carbon wire, bright, annealed, galvanized, or bethanized . . . we pay the strictest attention to all of the important details that mean top-quality steel wire.

At your convenience, we'd like to talk over your wire needs. Quite often we can help our wire customers to turn a problem into a profit. Just phone our nearest sales office for full details.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
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THE IRON AGE
Chestnut and 56th Sts.
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The Iron Age, published every Thursday by CHILTON COMPANY, Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 30, 1922, at the Post Office at Philadelphia under the Act of March 3, 1879. Price to the metal working industries only: In U.S.A. and possessions, Canada, Mexico, $3 for 1 year, $5 for 2 years, or the United States, its territories and Canada, All others $15 for 1 year; other Western Hemisphere countries, $25 per year. Single Copies, 50¢. Annual Review Issue, $2.00 each. Foreign, $5 a year.

The IRON AGE

December 26, 1957—Vol. 180, No. 26

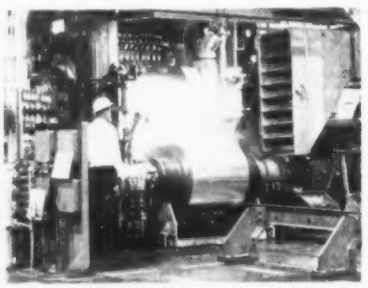
Digest of the Week in

*Starred items are digested at right.

NEWS ARTICLES

MILL MANAGEMENT

Pre-Planning Helps—Kaiser Aluminum's new plant at Ravenswood got off to a flying start because of



some careful advance planning. All foreseeable organizational and administrative decisions were made far ahead of time. P. 22

STAINLESS SANDWICH

For Wider Sheets—A new process developed by U. S. Steel, rolls thin-gage stainless and alloy steel sheets up to 90-in. wide. It may be the answer to aircraft and missile weight problems. P. 21

IRON ORE

Possible Surplus—Shipments of ore this year were based on a fourth quarter upsurge in steelmaking. Now a surplus in 1958 is possible. Imports continue to grow. P. 24

ELECTRIC AUTOS

Will They Come Back?—It looks like the auto industry will one day

Metalworking

WEST VS. EAST: The Free World is ahead in steel output, but Iron Curtain countries are gaining in technology. Here, workmen at a Jones & Laughlin Steel Corp. open-hearth shop skim slag from tops of molds. P. 19

be able to harness the sun's light. How soon the technique will be adapted to autos depends to some extent on the extent of the world's oil reserves. P. 32

CONGRESS

Tough Budget Ahead — Next year's budget can be balanced if non-essentials are cut down. But it will take a lot of courage for a congressman to vote against such things as veterans benefits. P. 37

FEATURE ARTICLES

BAND MACHINING

Avoids Chip Waste—Band machining is gaining ground as a way to make duplicate metal parts with a minimum of chip waste. High speed steel saw bands remove the last obstacle to the use of a band machine as a production tool. New machine designs take full advantage of automatic features. P. 49

BLAST CLEANERS

Treat Parts in Line—It's done in a plant where there's no cleaning room in the traditional manner. The cleaning units are spread out as integral parts of automated transfer lines. The benefits come in simplified handling and faster production. P. 52

CONTROL JIG BORER

With Punch Cards—A combination of punch cards with precision controls virtually eliminates setup time, reduces machine cycles, and saves on overall manufacturing costs. The new unit gets quality production without the attention of a skilled operator. P. 54

POWDER METAL PRESS

Gets Uniform Density — It's called proportional pressing. The two lower punches start their strokes at different levels and rates, but arrive simultaneously at full compression. It makes possible uniform density on odd shaped parts. P. 56

WELDING STAINLESS

A Choice of Techniques — The development of specialized stainless steels has been accompanied by equally marked advances in welding processes. It pays to know the basic metallurgical principles governing a specific alloy. P. 58

MARKETS & PRICES

INVENTORY PHOTOS

An Aid for Salesmen—The sales dept. at Rolled Steel Corp. keeps salesmen up-to-date on inventories by means of pictures. Photos of central inventory board are sent to districts weekly. P. 23

FARWEST STEEL BUYING

Due for a Slide — Steel users on the West Coast will be living off their inventories in the coming year. As a result mill shipments are expected to drop about a million tons, down to 6.8 million tons. P. 39

ALLOY MACHINING

Needed: A Speedup—Companies working with super-hard alloys have learned a hard fact. Cutting speeds must be reduced drastically to machine these new metals. Industry as yet has found no way to lick the problem. P. 41

STEEL GLOOM

No Good News—Practically all the news in steel this week is bad. Mill order backlogs are fast disappearing. And little new business is in sight. P. 73

ELECTRONIC CONTROLS

Unified Systems Urged—In just about any multi-motor machine being built today it's cheaper to use a single control box rather than separate units. Controls firms urge buyers to call in engineer-salesmen early in the design stage. P. 74

NEXT WEEK

ANNUAL ISSUE

Executives Forecast—A special feature of The IRON AGE 103rd Annual Issue, out next week, will be a forecast of 1958 business conditions by industry executives. They will report on such areas as inventories, wages, prices, and sales.

MARKET GUIDE

To Metal Consumers — If you sell stainless steel, aluminum or copper you won't want to miss this report. It lists major consuming industries of these metals in various forms and tells how much each industry uses.

COLD-DRAWN TUBES AND BETTER FINISHES

One of the many reasons why tubing is cold drawn is to obtain a better surface finish than it is possible to achieve as a hot finished tube. In the finishing of tubing by the cold draw process, any imperfection of the die or the mandrel is reflected in the product. Pick up on the mandrel, for example, can mar the inside surface of the tube.

Louis Friedel operates one of the many cold draw benches at B&W. Between every draw, his practiced eye makes sure his mandrel and die are in perfect condition. Years of experience in watching and making thousands of feet of B&W Cold Drawn Tubing enables him to exercise that judgment needed to tell what meets B&W's quality standards.

Many other men like Louis Friedel, generations of experience armed with the best equipment, put their knowledge into every foot of B&W Tubing. It's your assurance that the B&W Tubing you buy will meet your most exacting requirements. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pa.

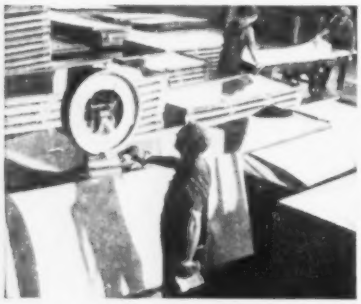
TA-6045-G6

Seamless and welded tubular products, seamless welding fittings and forged steel flanges—in carbon, alloy and stainless steels.

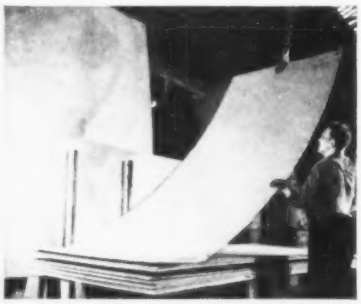
2351

types, shapes, sizes and finishes of Allegheny stainless in stock at Ryerson

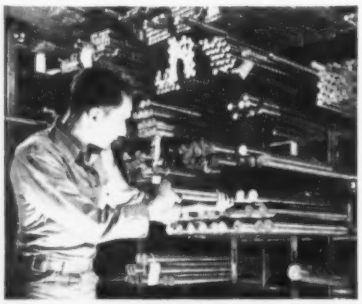
When you want stainless fast . . . anything from one to 2351 types, shapes, sizes and finishes . . . telephone Ryerson. You can depend on accurate processing and quick shipment from Ryerson . . . the nation's oldest supplier of stainless from stock.



STAINLESS SHEETS — Eleven analyses of Allegheny stainless sheets, including nickel and straight chrome types. Extra wide sizes, also, to reduce welding costs. Expanded and perforated sheets.



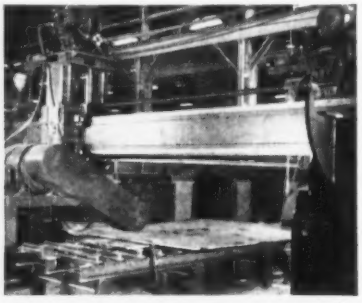
STAINLESS PLATES — Nine analyses, including plates to Atomic Energy Commission requirements and to ASTM specifications for code work. Also extra low carbon types for trouble-free welding.



STAINLESS BARS AND ANGLES — Eight types, including rounds, squares, flats, hexagons and angles. Free-machining bars with both analysis and mechanical properties controlled for best performance.

STAINLESS PIPE AND TUBING — Light wall, standard and extra heavy pipe, ornamental and regular stainless tubing. Also screwed and welding fittings and Cooper stainless valves.

STAINLESS CIRCLES, RINGS, SPECIAL SHAPES — No matter how intricate, we can flame-cut practically any shape from stainless steel plate. One piece or a thousand.



TRUE-SQUARE ABRASIVE CUTTING — Stainless plates up to 12' x 25' cut absolutely square on abrasive disc machine. Length and width tolerance plus or minus 1/32".

Principal products: Carbon, alloy and stainless steel — bars, structurals, plates, sheets, tubing, industrial plastics, machinery and tools, etc.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE • CINCINNATI • CLEVELAND DETROIT • PITTSBURGH • BUFFALO • INDIANAPOLIS • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Ode to the Old Man—
No "Organization Man" Is He

If some of our tough industry leaders had to take the battery of employment tests their own companies give, they might fail miserably. These fellows often walk alone.

Maybe there are many exceptions to what we have to say here. But in talking to a lot of old die-hards, one gets the idea that money isn't everything. One also gets the distinct feeling that love of work is not the basic reason for worn-out men—or misunderstanding wives.

You can be sure that the "old man" takes things a lot more seriously than we think. He doesn't want it to show. He has the idea that he is expected to be a 100 pct Spartan.

The "smart" psychiatrists — or the parlor quacks—have glib analyses of our big names. But somehow they don't seem to ring true when you really know and probe the Boss.

Take the chairman of the board of one of our big steel firms. Here is what he said privately: "When I don't feel too well I often stay away from the office because I don't want my acid nature that morning to adversely affect my associates." And this fellow is a tough baby; make no mistake about that.

If you want to get a measure of many bosses' deep feelings when people must be fired, laid off, or "transferred," a blood pressure gadget would tell the story. Perhaps a stomach tension meter would show it better.

The way some of our bosses tear themselves apart for the sake of duty is a travesty on accepted mental health. It just isn't right and makes no sense. But try to tell them that.

The boys in the back room have all the pat answers to our leaders' actions: They are compensating for a hard childhood and total rejection early in life, the wise-acres say. Much of such tripe is hogwash; chances are the fellows are doing a satisfactory but hard job because that's the only way they know how to do it.

And religion: They don't talk about it. They think it is no fit subject for the business circle. But most practice it—if not in the formal way; then in a down-to-earth practical way with no boasting.

If we had one fault to find with our leaders it might be that some haven't the courage to quit when that's what they are entitled to do by nature and achievement. But, God love them, we couldn't do without them, or they without work.

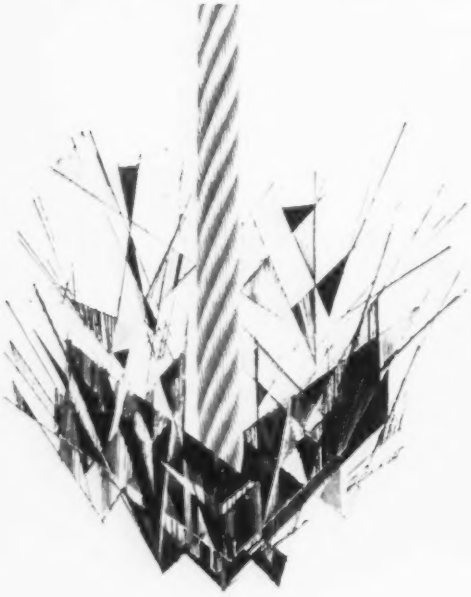
Tom Campbell

Editor-in-Chief

Stands up to **bending fatigue**

Absorbs **shock** and **impact**

Has **higher strength**



Withstands **Abrasion**

These four qualities
in Roebling Royal Blue Wire Rope
mean **longer service life!**

They all add up to the fact that Roebling Royal Blue will deliver more work on your job—regardless of what it is. It's as simple and money-saving as that. For full information on Royal Blue, the rope that's stronger than yesterday's strongest, talk to your Roebling Distributor or write Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities—
Subsidiary of The Colorado Fuel and Iron Corporation

Economy in Government

Sir — First, I congratulate both your Editor and Congressman Brown for the excellent article on government in business.

As Acting Director of the Citizens Committee for the Hoover Reports in the State of Pennsylvania it becomes my duty to: 1. Find men and women who will call upon Pennsylvania Congressmen and/or Senators and 2. Get as many of them as possible to support Hoover bills in the next sessions in Washington.

Toward this end, please: 1. Send me 100 or more reprints of Rep. Brown's article. 2. As fellow-Pennsylvanians tell me of any men or women who are ready and willing to help do this job. . . .—F. E. Schuchman, Pres., Homestead Valve Mfg. Co., Coraopolis, Pa.

▪ Wish we had time to help you on your very important project. While we can't send you the names we are sending the reprints right away.—Ed.

Sir—Congressman Brown's Nov. 28 article on "Government in Business" points out a real threat to free enterprise. However, his "sad example" of the government installation which offers its blueprinting service to other government facilities in the area does not appear to be a case for criticism.

Don't Criticize—It looks like one of our government departments had a real interest in the taxpayer when they decided to make efficient use of their equipment and labor. Surely no well-managed private company with several plants in the same area would have the blueprinting of one plant done by an outside company if they had capacity in another plant in the vicinity.

If we want economy in government we cannot criticize those who are trying to practice it.—C. A. Johnson, West Palm Beach, Fla.

▪ Sometimes it's hard to decide what is economy and what is competition with private business.—Ed.

Good Example

Sir—I read with interest your Nov. 28 article, "Business Booms for Production Warehouses." It was well written. I, too, feel certain that increased sales for the warehouses (in peacetime) will depend largely on steel processing for their customers.

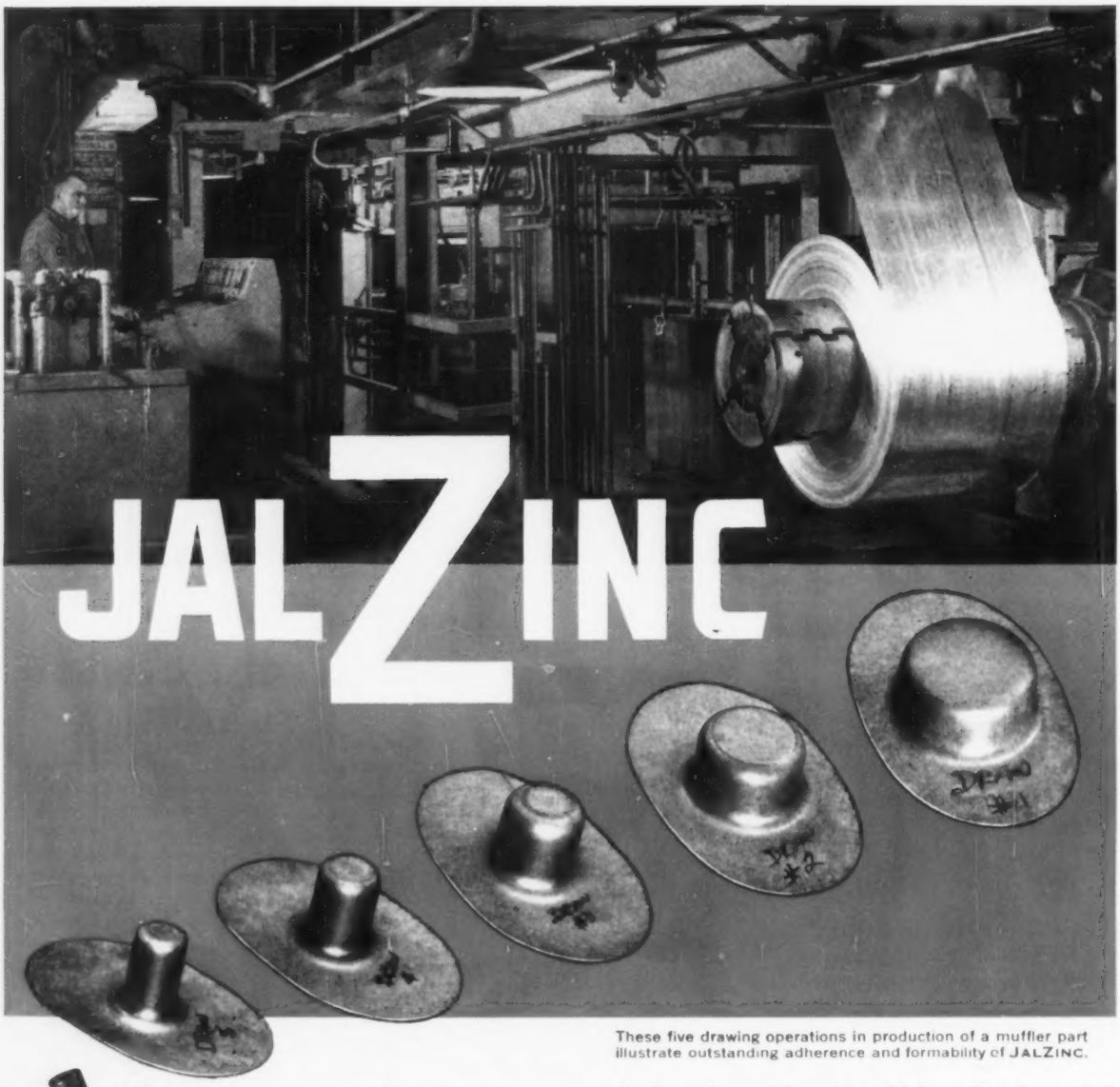
I had an example last week. I needed 40 pieces of 2¼-in. plate cut to an unusual shape. The warehouse by nesting the shapes, and with burning equipment to burn two at one time, quoted a price much less than I could buy the plate and process it in our plant.—T. M. Waltemath, Purchasing Agent, International Engineering Co., Dayton, O.

Meteorite Buffs

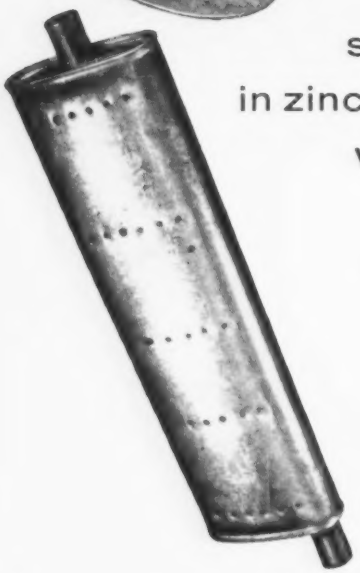
Sir—I enjoyed tremendously the article entitled "Meteorites: Metallurgy From Outer Space."—R. L. Collins, No. St. Paul, Minn.

Sir—The article, "Meteorites: Metallurgy From Outer Space," which appeared in the Dec 5 issue of your magazine, was most interesting.—E. A. Horn, Eastman Kodak Co., Rochester.

"It's the best way we've found to to start Fred on the road to creative thinking."



These five drawing operations in production of a muffler part illustrate outstanding adherence and formability of JALZINC.



sets the pace in zinc coated steel with superior drawing and forming properties

JALZINC, Jones & Laughlin's high quality zinc coated steel, has a tight uniform coating that resists cracking and flaking during forming or drawing. The uniform luster surface finish improves product appearance after even the toughest fabrication operation.

Improved adherence and ductility of the zinc coating is due to the modern Sendzimir continuous galvanizing line. Only the JALZINC base metal controls your limits of bending, forming and drawing.

JALZINC is available in a wide range of gages and widths in both cut lengths and coils. It can be furnished in various coating weights depending on your end product needs.

Call your local J&L district office for details, or write to the Jones & Laughlin Steel Corporation, Dept. 403, 3 Gateway Center, Pittsburgh 30, Pennsylvania. For out of stock requirements, call your local steel warehouse or sheet metal distributor.

Jones & Laughlin STEEL ... a great name in steel

The Old Know-How

An important part of our editorial job these days is keeping up with the fast-moving missile program. One of our editors recently attended a briefing of editors in Washington, D. C.

First on the program, sponsored by the Air Force Assn., was J. R. Dempsey of Convair Div. of General Dynamics. He has an impressive job, which we will withhold for a moment.

Hits Snag—Mr. Dempsey fiddled with his microphone, shook it, blew into it, but couldn't make it work. It was finally replaced.

After an intermission, James Straubel, executive director of the association, and chairman of the meeting, explained the problem.

There had been no technical trouble with the microphone, he said. But Mr. Dempsey, the director of the Atlas ICBM program and manager of the Astronautics Div. of Convair, had just not been pressing the button to make it work.

Puzzlers

If we'd known the answer was so long we'd never had printed the puzzler (December 5 about the chain and links, etc.)! But here it is:

Four breaks is the answer—he took out the 6th, 17th, 38th and 79th links.

Solution: 1. It is obvious that payment must not be made in individual links.

2. The solution is reached by thinking of payments in terms of making change. For example, you may give a five link piece and receive in change an amount equal to four links thereby making the payment of one link on that particular day.

3. Taking out the 6th, 17th, 38th and 79th links there are:

4. A five-link, a ten-link, a twenty-link, a forty-link, an eighty-link piece and four single links.

First day—pays one link.

Second day—pays one link.

Third day—pays one link.

Fourth day—pays one link.

Fifth day—pays the five-link piece and receives back four single links.

Sixth, seventh, eight and ninth days he pays one link each day.

Tenth day—pays ten-link piece and receive back the five-link piece and four singles.

This process continues. On the fifteenth day he adds the five-link piece to the ten link and gets back four singles.

On the twentieth he pays the twenty-link piece and gets back the ten link, the five link and the four singles.

He continues in the same manner. On the next to the last day he pays the eighty, forty, twenty, ten and five-link pieces and three singles. On the last day he pays the last single-link, his money arrives, he redeems the chain and sails home by the next boat!

See?

. . . and all the winners: Herbert Klebaum, Republic Steel Corp., Canton, Ohio; James W. Mull, Jr., wha' hoppen?, and Myron R. Bowerman, The Alliance Machine Company, Alliance, Ohio.

"Some lawyer! He advised me to stay away from her."

UNIONMELT Welding
makes short work of tall towers

People who make the "big ones" use UNIONMELT Granular Composition, OXWELD Wire, and UNIONMELT Welding Heads and Controls. They get quality welding, dependable service, and true economy.

UNIONMELT equipment and materials have been used to weld many thousands of "big ones" (and "little ones," too) since LINDE first introduced the submerged melt process 23 years ago. Whether your jobs are big or little, you can do them quickly and economically—manually or automatically—with UNIONMELT Welding.

Learn more about UNIONMELT Welding and other LINDE-developed welding processes and materials. Write Dept. J-16 for a copy of the booklet, "Modern Methods of Joining Metals"—it's yours for the asking. LINDE COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y. *In Canada:* Linde Company, Division of Union Carbide Canada Limited.

One-inch steel plate for this king-size fractionating tower was UNIONMELT welded. The same LINDE method and materials can be used to weld 11-gage sheet steel (above).

Linde

UNION CARBIDE

The terms "Linde," "Unionmelt," "Oxweld," and "Union Carbide" are registered trade marks of Union Carbide Corporation.

EXHIBITS, MEETINGS

Plant Management and Engineering Show—Jan. 27-30, 1958, International Amphitheatre, Chicago.

Packaging Machinery and Materials Show — March 25-28, Convention Hall, Atlantic City, N. J. (Hanson & Shea, Inc., One Gateway Center, Pittsburgh 22.)

JANUARY

Southern Industrial Distributors' Assn.—Midyear meeting, Jan. 6-8, Roosevelt Hotel, New Orleans. Society headquarters, 1626 Fulton National Bank Bldg., Atlanta, 3, Ga.

Society of Automotive Engineers, Inc.—Annual meeting, Jan. 13-17, Hotels Sheraton-Cadillac and Statler, Detroit. Society headquarters, 485 Lexington Ave., New York 17.

Malleable Founders' Society—Semiannual meeting, Jan. 17, Hotel Cleveland, Cleveland. Society headquarters, 1800 Union Commerce Bldg., Cleveland.

Institute of Scrap Iron & Steel Inc.—Annual meeting, Jan. 19-22, Eden Roc, Fountainbleau, and Deauville hotels, Miami Beach, Fla. Society headquarters, 1729 "H" St., N. W., Washington 6, D. C.

Truck Trailer Manufacturers Assn.—Annual meeting, Jan. 20-22, Palm Beach Biltmore Hotel, Palm Beach, Fla. Society headquarters, 710 Albee Bldg., Washington 5, D. C.

American Road Builders' Assn.—Annual meeting, Jan. 20-23, Sheraton-Park Hotel, Washington. Society headquarters, 600 World Center Bldg., Washington 6, D. C.

American Institute of Electrical Engineers — Winter meeting, Jan. 20-24, Hotel Statler, New York. Society headquarters, 33 West 39th St., New York 18.

Steel Shipping Containers Institute, Inc.—Winter meeting, Jan. 21-22.

(Continued on P. 14)

EXHIBITS, MEETINGS

(Continued from P. 13)

St. Regis Hotel, New York. Society headquarters, 600 Fifth Ave., New York 20.

Association of Steel Distributors, Inc.—Convention, Jan. 26-Feb. 2, Algiers Hotel, Miami Beach, Fla. Society headquarters, 29 Broadway, New York 6.

Industrial Heating Equipment Assn.—Annual meeting, Jan. 27-28, Penn - Sheraton Hotel, Pittsburgh. Society headquarters, 1145 19th St., N. W., Washington 6, D. C.

February

Malleable Founders Society—Technical and operating conference, Feb. 6-7, Wade Park Manor, Cleveland. Society headquarters, 1800 Union Commerce Bldg., Cleveland.

American Society for Quality Control—Annual conference on management by exception, Feb. 7-8, Carter Hotel, Cleveland. Information: B. F. Goodrich Chemical Co., 3135 Euclid Ave., Cleveland.

Institute of Surplus Dealers—Annual trade show and convention, Feb. 14-17, New York Trade Show Bldg., New York. Society headquarters, 673 Broadway, New York 12.

American Institute of Mining, Metallurgical & Petroleum Engineers—Annual meeting, Feb. 16-20, Hotels Statler and Sheraton-McAlpin, New York. Society headquarters, 29 W. 39th St., New York.

MARCH

American Machine Tool Distributors' Assn.—Spring meeting, March 10-11, The Roosevelt, New Orleans, La. Society headquarters, 1900 Arch St., Philadelphia 3.

Steel Founders' Society of America—Annual meeting, March 17-18, Drake Hotel, Chicago. Society headquarters, 606 Terminal Tower, Cleveland 13.

IN KITCHEN ACCESSORIES, TOO

Sharonsteel Quality STANDS OUT

• Many different types of steel are required in the manufacture of kitchen accessories. — Stainless Steels for trim and assemblies that come in contact with foods — Alloy Steels for parts that must absorb punishment — Carbon Steels for cutting blades, frames and cases. The ability to constantly produce a wide variety of quality steels is another reason why Sharon has always been a leading supplier to this ever expanding industry.

SHARONSTEEL

For 56 Years a Quality Name in Steel

SHARON STEEL CORPORATION, SHARON, PENNA.

CHICAGO, CINCINNATI, CLEVELAND, DAYTON, DETROIT, GRAND RAPIDS, INDIANAPOLIS, LOS ANGELES, MILWAUKEE, NEW YORK, PHILADELPHIA, ROCHESTER, SAN FRANCISCO, SHARON, SEATTLE, MONTREAL, TORONTO

"With Weirkote you can forget plating or dipping after fabrication. It just won't peel or flake!"

Q.—Weirkote—is that a new kind of steel?

A.—*"New" only to those who don't know of its advantages. It's a zinc-coated steel with a skin-tight surface, produced by a continuous galvanizing process instead of the old pot-dip method.*

Q.—Well, we've tried galvanized before for the parts and products we make. But it just couldn't stand up under the punishment of fabrication.

A.—*Must have been the old type galvanized. When you use Weirkote for fabrication, you'll find its surface stands up under the severest stresses. Punch it, lock it, crimp it, deep-draw it—its zinc coating stays intact. It's got a* built-in *resistance to peeling and flaking.*

Q.—Well, say—that'd save all the cost of plating or dipping after fabrication, wouldn't it?

A.—*Exactly! Plus assuring you a* uniform *protective coating at all times—something even a special coating doesn't always provide on the more intricately fabricated parts.*

Send today for free booklet that details the time- and cost-saving advantages of using skin-tight zinc-coated Weirkote. Write Weirton Steel Company, Dept. A-1, Weirton, West Virginia.

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA
a division of
NATIONAL STEEL CORPORATION

New Tool Grinding Method

A machine tool builder has a promising new method for grinding cutting tools. It's said to be especially useful for carbide tools used with transfer machines. Pilot production tests show tool life boosts of 40 pct and better, promising significant cuts in downtime and gains in output. The grinding technique also holds promise for boring tools and others used in precision machining.

Low-Cost Aluminum Houses

An experimental home, made entirely of aluminum-skinned, load bearing panels, shows promise in the low-cost, fast-construction field. The cored panels are 4 ft wide and have textured, colored aluminum skins. Used for interiors as well as exteriors, they're strong, durable, attractive and maintenance-free.

Make Gasoline Briquettes

Russian scientists have found a way to emulsify and solidify gasoline in the form of cylindrical briquettes. This could solve certain problems of storage, transportation and evaporation in hot climates. Formaldehyde emulsifiers disperse the gasoline, and oxalic acid solidifies the emulsion. The resulting "cake" has a microcellular matrix which contains the gasoline. Extraction of liquid fuel requires a suitable press.

Taxes Going Up?

Ike's plea for strict economy to make more funds available for military projects falls on deaf ears in Washington. The Senate and the House have election-year fever. Neither party wants to arouse voter wrath by cutting down on farm handouts or veterans' benefits. Taxes may have to go up to pay the bigger overall budget bill.

Spectrometer Tests Oil

To check trouble before it starts, samples of lubricating oil from one railroad's diesel fleet are given regular spectrometer tests. Samples are examined for the presence and quantity of 16 elements. Traces of lead and copper indicate the start of bearing wear. Or if silicon turns up, it may mean that roadbed dirt is getting in the engine. Tests save on overhauls, oil changes.

No Automation for Missiles

Don't expect a metalworking equipment boom to grow out of an accelerated missile program. Automated production is ruled out; accuracy needed is too high, planned rate of output is too low. Nor do missile makers expect any serious shortages of raw materials. There is one bottleneck, though: A shortage of wind tunnels for making supersonic speed tests.

Import Wire for U.S. Roads

Adding to wire producers' import woes, a new welded-wire fabric plant is going up in Florida. Products, made from low-priced, imported wire, will be aimed at the lush roadbuilding and construction market. A good 1958 season is expected due to the impact of the U. S. highway program, also pent-up demand stemming from the recent concrete strike. Alabama mills are the closest competition.

Faster Than a Wink

The Army has a camera shutter that can snap a picture in five billionths of a second. Thus it can now photograph phenomena occurring in high speed shock waves, explosions and certain nuclear reactions. Secret of the new shutter is in a hermetically-sealed, large-aperture, wide-angle cell which has no moving parts. It does contain a chemical which can be "pulsed" electronically.

Mirror-Like Tube Interior

A mirror finish on the interior of seamless, stainless tubing is said to promote freer flow and better corrosion resistance. Developed to sell at no extra cost, the new type of tubing comes in sizes ranging from ⅜ to 1-½ in. OD, and in wall thicknesses from 0.020 to 0.109 in.

You get automatic foolproof lubrication with LUBRIVAL circulating oil system

FARVAL—
Studies in Centralized Lubrication
No. 207

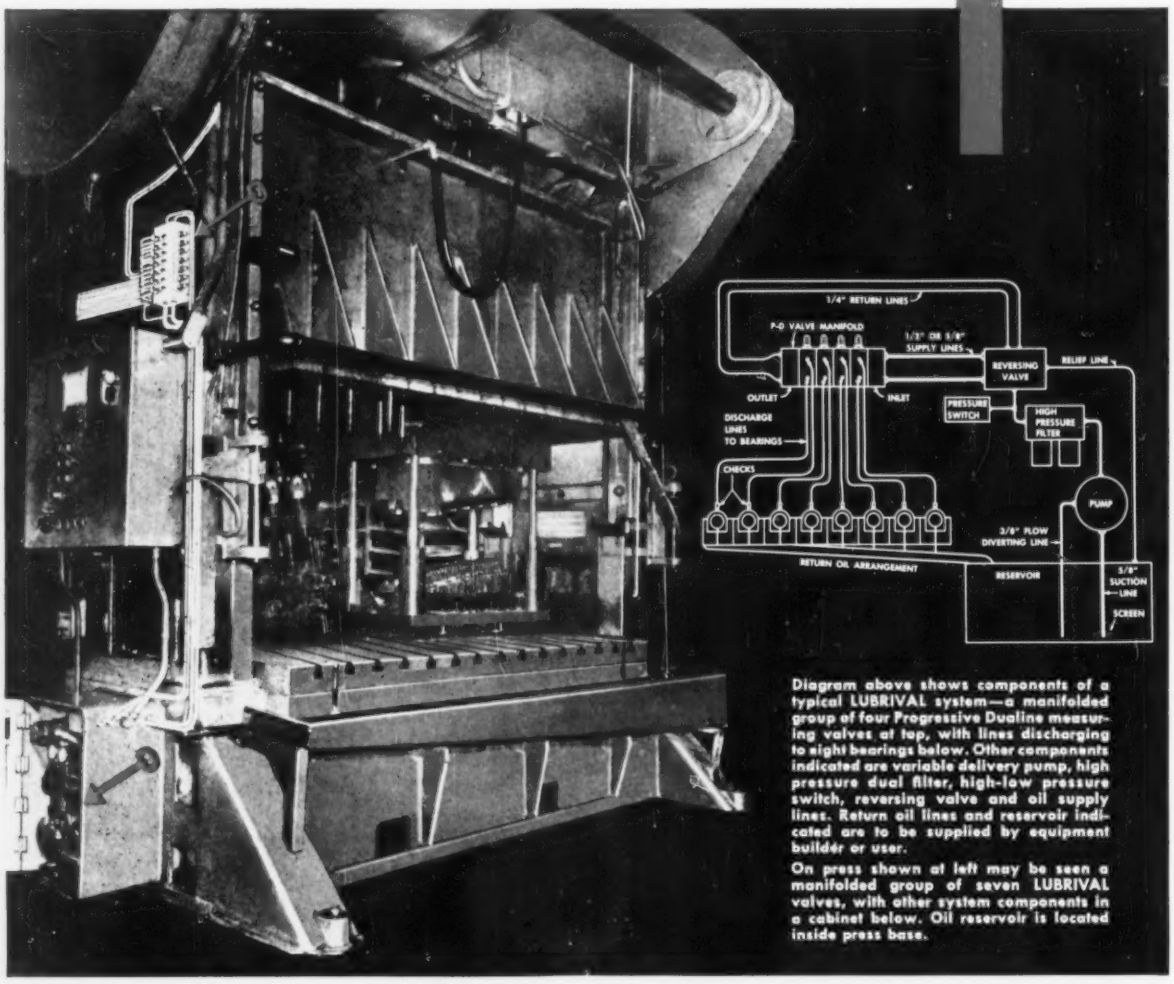


Diagram above shows components of a typical LUBRIVAL system—a manifolded group of four Progressive Dualine measuring valves at top, with lines discharging to eight bearings below. Other components indicated are variable delivery pump, high pressure dual filter, high-low pressure switch, reversing valve and oil supply lines. Return oil lines and reservoir indicated are to be supplied by equipment builder or user.

On press shown at left may be seen a manifolded group of seven LUBRIVAL valves, with other system components in a cabinet below. Oil reservoir is located inside press base.

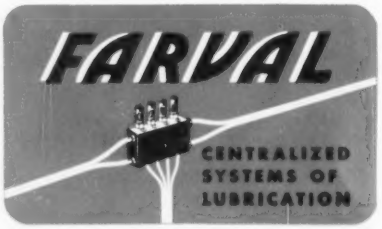
The bearings of this 150-ton metal stamping press and others of its type are now protected by LUBRIVAL. This new Farval system for circulating oil is being installed on many varied kinds of machine tools, presses, automated machines, and other equipment calling for circulating oil lubrication.

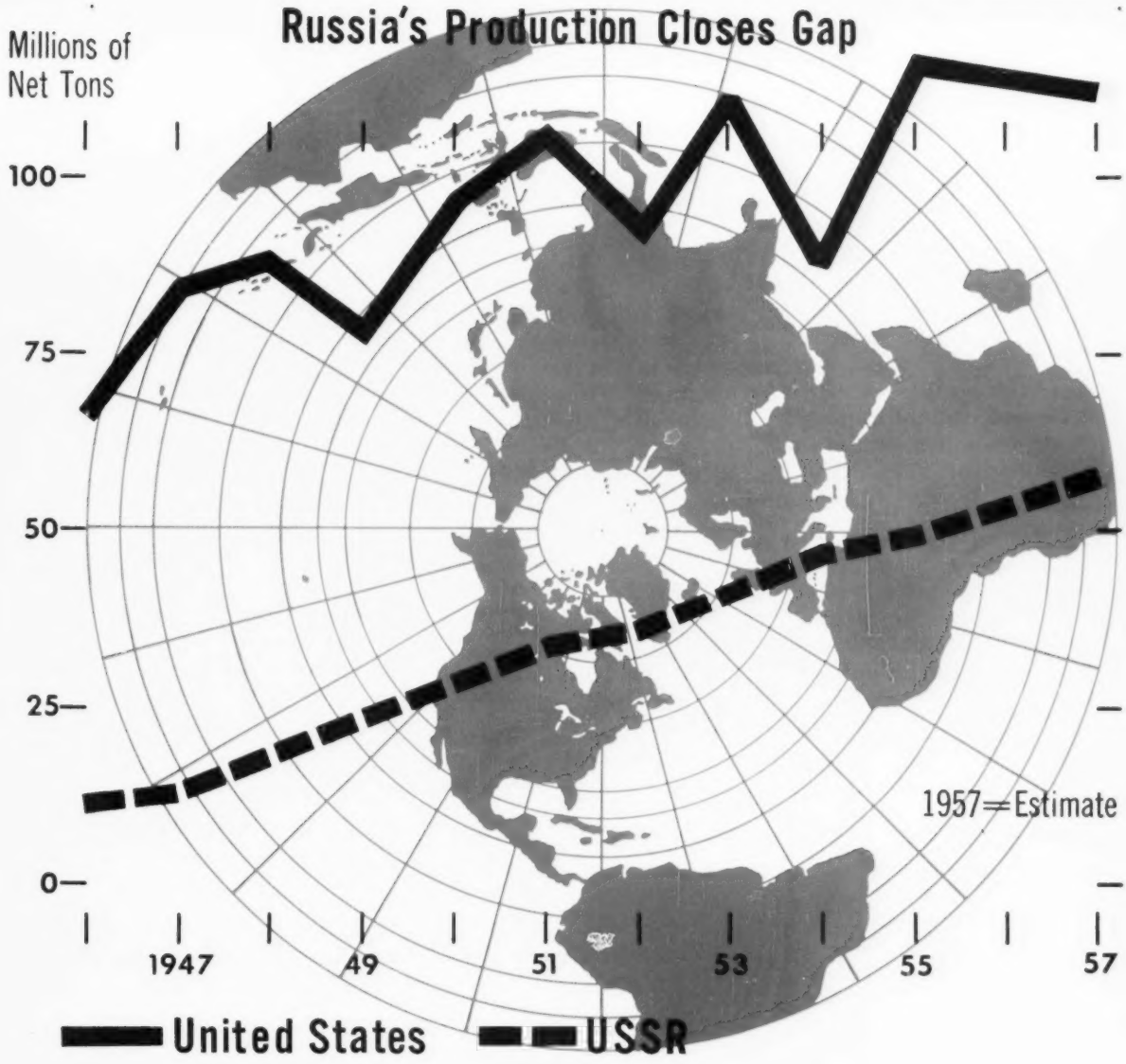
Employing the famous Dualine principle, LUBRIVAL delivers oil to manifolded measuring valves which feed it under pressure to the bearings. Lubricant is force-fed by positive piston displacement. Flow can be regulated over a range of 10 ounces to one gallon per minute. Valves have individual sight indicators and offer a degree of installation and operational flexibility previously unknown in such devices.

The Farval representative near you will give you all details. Or write for Bulletin 70. The Farval Corporation, 3282 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

KEYS TO ADEQUATE LUBRICATION—
Wherever you see the familiar Dualine valve manifolds, dual lubricant lines and central pumping station, you know a machine is being properly lubricated. Farval manually operated and automatic systems protect millions of bearings.





West Still Leads in Steel Output But Reds Gain Technically

Russians pull ahead in some blast furnace production techniques. They could be out front in high-temperature metals.

But alloy productive capacity is limited, and they lag in rolling equipment.

▪ The Free World still holds a big edge over Communist countries in steel output.

But some nagging doubts have cropped up on (1) how long overall supremacy can be maintained, and (2) whether we're still ahead in some technical areas.

U. S. Versus Russia—Despite a drop in U. S. production, Free World steel output in 1957 was about 242 million ingot tons, compared with 236 million tons a year earlier. Red nations last year produced over 80 million tons, up from

Mapping World Steel Production

Thousands of Net Tons

Free Nations

	1957	1956
Australia	3,400	2,914
Austria	2,700	2,290
Belgium	6,900	7,028
Brazil	1,600	1,504
Canada	5,300	5,306
France	15,200	14,770
West Germany	26,600	25,581
India	1,900	1,947
Italy	7,300	6,512
Japan	15,200	12,243
Luxembourg	3,900	3,809
Mexico	700	648
Netherlands	1,300	1,159
Saar	3,800	3,719
South Africa	1,800	1,708
Spain	1,500	1,370
Sweden	2,700	2,648
United Kingdom	24,300	23,138
United States	113,200	115,216
Others	2,600	2,360
Total	241,900	235,848

Iron Curtain Nations

	1957	1956
China	5,500	5,024
Czechoslovakia	5,600	5,382
East Germany	3,200	3,020
Hungary	1,500	1,571
Poland	5,900	5,527
Rumania	1,100	862
U.S.S.R.	56,000	54,443
Yugoslavia	1,400	977
Total	80,200	76,806

77 million tons in 1956.

U. S. output of 113 million tons was just about twice the 56 million tons produced by Russia in 1957. In the previous year it was 115.2 million for the U. S., 54.4 million for Russia.

Red Ingenuity—Technologically, Russia is closing the gap fast. It has pulled ahead in some blast furnace production techniques. It may be out front in high-temperature metals. It not only has "borrowed" ideas from the West; it has shown "bold imagination" in adapting these ideas to its own needs.

Even more worrisome: Metallurgy is the No. 1 technical study in Russia. Each year it graduates 10 metallurgists to our one.

First-Hand Report—These are some of the findings brought back from Russia by Dr. Morris Cohen, professor of metallurgy at Massachusetts Institute of Technology, and Dr. Dennis J. Carney, division superintendent of steelmaking, Duquesne Works, U. S. Steel Corp.

Here is a composite of what Drs. Cohen and Carney learned on a recent tour of Russian steel plants:

Production Comes First—Russia is after maximum production at any cost. Worker safety and comfort come second. Hot openhearth roofs are torn out and rebuilt in 24 hours. When a blast furnace is to be rebuilt, the new unit is prefabricated, says Dr. Cohen. Downtime is cut to 40 days. In the U. S., it usually takes longer, but fewer men are assigned to the job.

The Reds are getting more production from the same size blast furnace than we are. At the Magnitogorsk Works, in Siberia, furnaces are yielding 2300-2400 tons of iron per day. This compares with about 1700 tons in the U. S., and a peak of around 2000 tons. The Russian secret is higher blast temperatures, higher blowing rates, closer attention to ore conditioning, and greater use of sintering. They look for a 10 pct boost in iron output when they go from 80 pct to 100 pct sinter. Coke quality is better than ours.

Blackout on Alloys—Russia operates a unique "pilot plant" mill known as the Tula Works. It has a capacity of about 500,000 tons a year and is largely used for trying out new ideas on a production basis. This is a luxury U. S. mills, operated for profit, can't afford. Tests on oxygen and continuous casting are conducted at Tula.

While the Russians have an "open door" policy in most areas of metallurgy, they are secretive about their progress in special metals and alloys. Dr. Cohen suspects they may have made some breakthroughs, judging by the performance of their jet engines. But

their capacity to produce stainless, alloy, and other special steels is limited.

Behind on Rolling—The Reds trail the U. S. in steel rolling techniques. Dr. Carney says they do less conditioning of ingots, probably operate on a par with some of the older shops in this country. Consensus: Russia is neither very good nor very bad in this area.

Dr. Cohen believes that continuous casting will be part of most new steel plants in Russia. He says the Reds are processing carbon, alloy, and stainless steels by continuous casting. But Dr. Carney feels otherwise. He says Russia is thinking of the process for stainless and special steels, not for tonnage production. He points out that new blooming and slabbing mills are going in at Magnitogorsk.

Trend in Openhearths—Russian openhearth productivity is good, but still a bit under ours. The Reds are going in for bigger furnaces. They have 500-ton furnaces in operation, and all new ones will be this size, according to Dr. Cohen. New furnaces are all-basic construction with roofs suspended. Operating temperatures run over 3000°F. Roof life on big furnaces is 500-600 heats compared with 300-400 in the U. S. Probable reason: Openhearth roofs are not allowed to cool below 2750°F. Checkers are run much hotter (2450°F) than ours and have about half the life.

The Russians are using and building oxygen converters. One is under construction in the southern steel district; others are in production at Leningrad. They feel that converters fit best into plants that have excess blast furnace capacity. They have reservations about the process on the grounds that the yield is 1-2 pct less than openhearths.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

New Process Rolls Wide Alloy Sheets

■ A new "sandwich" rolling process developed by U. S. Steel Corp. may be an answer to the aircraft and missile industry's weight-strength problems.

The process already has demonstrated an ability to produce light-gage stainless and alloy sheets up to 90 in. wide—nearly twice the width possible with conventional methods.

In the offing is elimination of many joints and seams now needed to fabricate airframe parts and missile skins from narrower sheets. The result would be valuable weight savings.

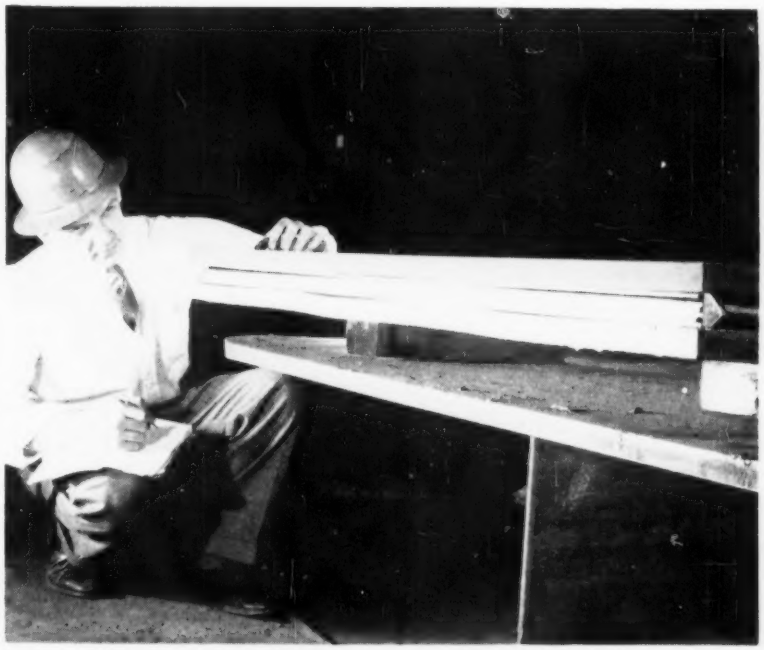
Reduced 90 Pct — The new method consists of sandwiching stainless or alloy steel plates between two heavier plates of ordinary carbon steel. The sandwich is closed tight with welded-in side and end bars. Then it is heated and rolled to size.

A typical 3-in. sandwich consists of four stainless plates, each 5/16-in. thick, covered top and bottom by 1-in. carbon plates. It is rolled down to a plate 3/8-in. thick—a total reduction of about 90 pct.

When the end and side bars are sheared off to open the assembly, the stainless steel sheets measure 90-in. wide, 230-in. long, and .033-in. thick.

Advantages — Important is the fact that the job was done on conventional rolling mills and heating equipment. In rolling, the sandwiches have the working characteristics of the carbon steel cover plates rather than the stainless or alloy steels inside.

The process was developed by Howard S. Orr.



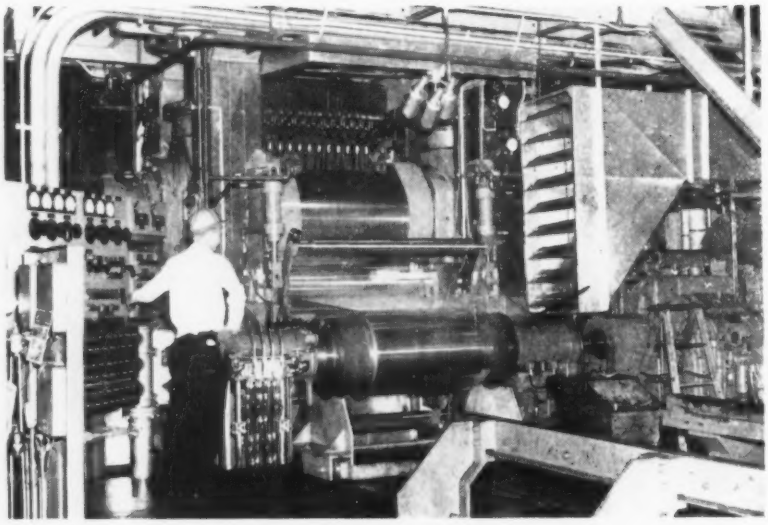
STEEL SANDWICH: James Noble, metallurgist at U. S. Steel's Homestead Works, inspects steel sandwich prior to hot-rolling. In center are stainless steel sheets covered by carbon steel sheets.

Pre-Planning Benefits New Mill

Kaiser Aluminum got off to a running start at its new plant in Ravenswood.

One big reason: Full-scale advance planning on organization and administration.

Every foreseeable issue was settled long before operations began.—By G. J. McManus.



RAVENSWOOD: In one week making customer shipments.

▪ Advance planning is paying off by giving Kaiser Aluminum a running start in its big new plant at Ravenswood, W. Va.

The first major rolling mill at Ravenswood began operating in January of this year. Within one week, the plant was making customer shipments. In the first month, 1 million lb of flat rolled product went out to users. In the fourth month, 5 million lb were shipped.

Quality in a Hurry—Full integration of the Ravenswood works was originally planned as a 10-year proposition. Under an accelerated timetable, the first of four potlines was tapped in November. Quality was "as good as I've ever seen," said one aluminum veteran.

KAISER'S AMOS: "We set out to make all the forseeable decisions ahead of time."

This progress has been made despite the fact that 90 pct of Ravenswood's 1000 hourly workers came to the plant without previous aluminum experience. Some 7000 construction workers are still swarming over the site, completing buildings and installing equipment. The plant is breaking in at a competitive time, with customers extra fussy about quality.

Leaves Time to Operate—Explaining the impressive debut under these circumstances, works manager Lloyd Amos says this:

"We set out to make all the foreseeable decisions ahead of time. When it came time to start operating equipment, we wanted to have supervisors free to make the decisions that couldn't be foreseen."

Mr. Amos came to Ravenswood with a brilliant record in top operating posts at both Kaiser and Reynolds. He feels the pre-planning effort at Ravenswood has succeeded with something to spare. During the critical break-in period it has not been necessary to keep calling key men together for meetings on administrative procedure and organizational structure.

These details were worked out by Kaiser in planning sessions that began formally in 1954, when the decision was made to go ahead with Ravenswood. At that time a project group under Dave Mayers was formed in Oakland. An engineering section was assembled to deal with construction and equipment. An operating team was formed to work out procedures and to provide a management nucleus for the future plant.

Drawing the Lines — In February of 1955 ground was broken at Ravenswood and the planning effort was stepped up. The operations group grew to 50 and was joined by Bill McAlwee, who now heads up administrative services at Ravenswood.

In this period organization lines were drawn, management people were collected and work methods were devised. The unbuilt plant was organized under a works man-

ager into four staff divisions and two operating groups.

Staff functions lined up as industrial relations; business services; management engineering; and engineering. The reduction plant was set up as one main operating group; the sheet and foil plant as the other. In two borderline situations, the casting department was made part of the sheet and foil plant; and the foil department was separated from the rolling department within the same plant.

Departmental Spell - Out — For supervisors in the new plant, Kaiser pulled in experienced men from its own organization. The top men among these sat down in Oakland to work out operating details. It became clear in a hurry that before the plant could be tied together, the methods of individual departments would have to be spelled out.

With guidance from the pre-planning staff, supervisors went through the process of thinking through and setting down procedures of their departments. Practices of older plants were borrowed but an effort was made to avoid swallowing customary methods without examination and modification.

In early 1956, the operating team began moving into Ravenswood. By then the procedures of individual departments had been pretty well staked out. The big job remaining was meshing the parts together into a smoothly unified whole. Here, the group moved into some virgin territory since Ravenswood is the first Kaiser aluminum plant to integrate reduction and rolling operations.

Getting Acquainted —For three weeks 21 supervisors put their heads together and thrashed out the relations between departments.

As a result of pre-planning sessions, supervisors gained a first-name acquaintance with each other. The decks were cleared of bothersome little decisions as to who can authorize plant visitors and who can requisition transportation.

Photos Answer Stock Questions

▪ Any company having a rapid inventory turnover is faced with a tough job keeping salesmen informed on what's in stock and what isn't.

It's embarrassing for a salesman to sell for immediate delivery an item that his company doesn't have in stock. On the other hand, it is aggravating to lose a sale because the salesman didn't know a certain item was available.

Such problems were solved by Rolled Steel Corp., Skokie, Ill., as easily as clicking a camera shutter. The answer was found in photography.

Blackboard Tally—Rolled Steel keeps a running inventory on big blackboards at its home office for ready reference by the telephone sales staff. The inventory consists of some 1000 entries, and requires the full-time services of an employee in keeping it up to date.

According to S. F. Furton, vice president-sales, such a large inventory would require two full days to transcribe by hand before copies could be sent to field salesmen.

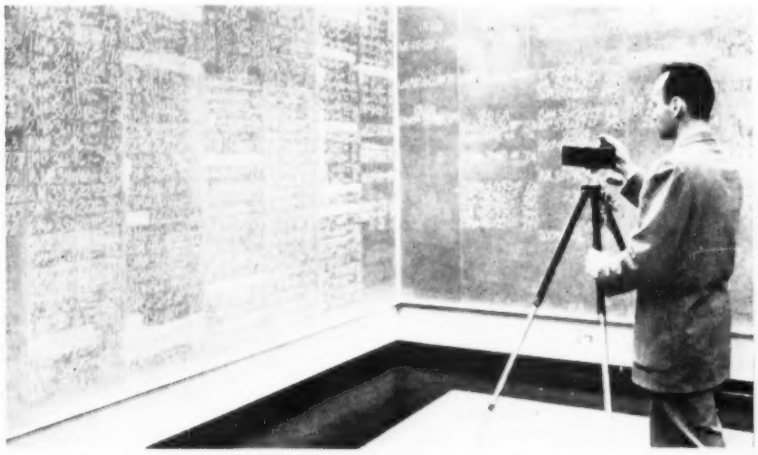
Series of Shots—It was decided to experiment with photographing the board. An employe using a 2¼ by 3¼-in. sheet film camera was assigned the picture-taking job. A series of 11 shots was needed to cover the 122-ft board.

Now it's standard practice at Rolled Steel to photograph the board on Friday afternoons, develop the prints in the company's dark room, and send them air mail to salesmen in outlying districts.

Ready to Sell — By Monday morning, the complete inventory is in every salesman's hands.

While this method keeps salesmen up-to-date on inventories, it also has other advantages. Rolled Steel points out the reduction in clerical costs, elimination of transcribing errors, and big savings in long distance telephone bills.

Prior to the new picture-taking system, the company had an average of 15-20 calls for inventory information coming in from Houston alone.



CLEAR PICTURE: Complete steel inventory chalked up on blackboard at Rolled Steel Corp., Skokie, Ill., is photographed each Friday afternoon. Prints are in the hands of district salesmen by Monday.

Ore Surplus Indicated for 1958

Shippers hauled a near-record tonnage, expecting a fourth quarter upsurge.

Now, stocks on hand are high enough to point to a surplus.— By T. M. Rohan.

• Lake Superior district iron ore shippers have just wound up one of their best seasons in recent years with 84.6 million tons shipped. But many are wondering whether they hauled next year's ore this year.

Stocks on hand for all U. S. districts are 11 million tons over a year ago and consumption to November was running 11 million tons behind a year ago.

Second Best—The 84.6 million tons hauled in the district this year is the best since 1955 when it hit 87 million and sharply under 1953's 95 million. Last year, with about two months knocked out by the steel strike, boats were pushing ice into December and finally hit 77.6 million.

Reason for the surge this year is that most steel men confidently expected a fourth quarter upturn in steel production. But it didn't materialize. Blast furnace consumption has remained at relatively high levels until lately despite a sagging steel market.

There are several reasons. Mills have been using a high percentage of hot metal in their openhearths, in some cases up to 80 pct, to keep blast furnaces going. Blast furnace shutdowns can cost from $500,000 up because of relining. The pig iron market has also sagged.

Surplus Coming—With steel output finally getting to the point where operation would create surplus of pig iron, the blast furnaces are being cut back. As of Nov. 1, only 220 out of 273 were in operation compared to 262 a year ago.

From the ore standpoint, this would indicate ore consumption will be low until the start of the 1958 shipping season in spring. By the end of the year, stocks on lower lakes ports will equal about 60.6 pct of 1957 consumption. So a significant surplus for 1958 appears in the works.

Taconite Stronger — In 1958, taconite shipments are expected to be a strong factor. Financially, the steel company investment in pelletizing plants is so high the plants must be favored over direct shipping mines to keep up amortization.

Reserve Mining, owned by Republic and Armco, this year shipped out about 5.1 million tons and will pile up stocks through the year. Erie Mining Co.'s giant Aurora, Minn., plant, delayed a year by the 1956 steel strike, started pilot production this year. It will work through the winter and have substantial inventory on hand early next year.

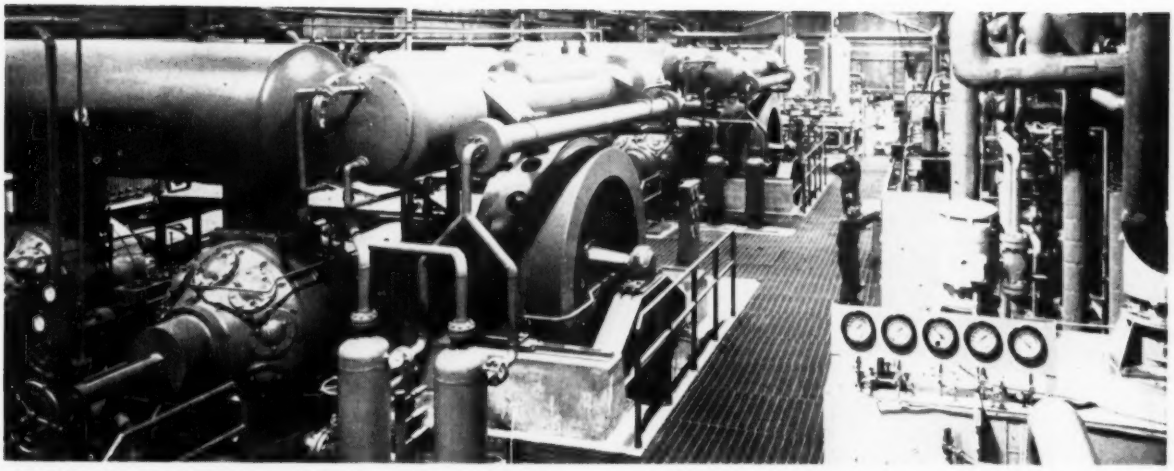
The Lake Superior district furnished about 65 pct of the total tonnage this year, but imports are growing. Through October this year imports, except Canada, had reached 18.6 million tons compared with 14.7 million last year.

Lake Superior Iron Ore Shipments From Upper Lakes Ports

(Gross Tons)

1957	84,614,734
1956	77,633,027
1955	87,459,853
1954	60,793,697
1953	95,844,449
1952	74,910,798
1951	89,092,012
1950	78,205,592
1949	69,556,269
1948	82,937,192

PRICES: A 25¢ per ton boost in price of Mesabi ore is likely. Higher freight and labor costs will dictate the boost.



OXYGEN ALWAYS: A problem of oxygen steelmaking is supplying large quantities of oxygen for short periods, several times an hour. Jones & Laughlin, with Air Products Inc., has solved the problem at J & L's Aliquippa, Pa., works by operating two identical plants with duplicate and intricate controls (above), and building facilities to store up to 6.5 million cu ft of liquid oxygen. Output of over 230 tons of 99.5 pct pure oxygen daily is also used for scarfing and general requirements.

Science Education Aid Planned

A long-range program to bolster this country's sagging scientific education in high schools and colleges is being drafted by the Administration and top educators.

State Funds Also—Tentative cost will be $150 to $250 million a year in federal funds, and $100 million or more in new state matching funds.

There are five parts to the scientific education program. But some may be dropped before the package is finalized for Congress.

(1) Federal grants to states, which they would match, to expand and improve science and mathematics courses. The states would decide how the grants are spent, within bounds.

(2) A program of testing, counseling and scholarships. Testing would uncover bright students in the eighth or ninth grades. Scholarships would be offered, running from $500 to $1000 per student. They would be available for some non-science course.

(3) A general fellowship program for graduate students involving payments to the students as well as the schools.

(4) Creation of centers or institutes of foreign language in universities. They would concentrate on languages important in modern affairs, but infrequently taught.

(5) Provide laboratory buildings and equipment at universities and technical schools.

Armco May Acquire National Supply

Directors of Armco Steel Corp. and the National Supply Co. have agreed on terms under which Armco would acquire National Supply.

The agreement calls for National Supply stockholders to get .85 shares of Armco common stock for each share of National Supply common. Details of the plan will be worked out by company directors and submitted for corporate action.

Ike Wants Additional Billion for Missiles

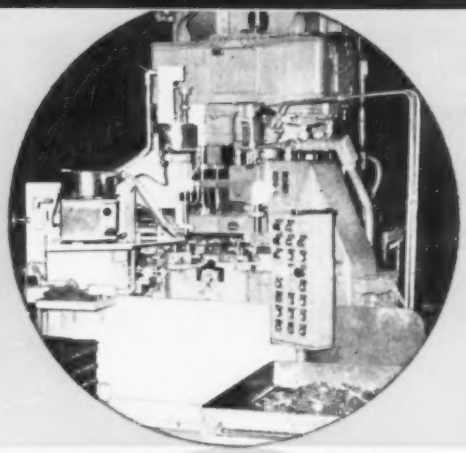
The Eisenhower Administration wants to pump another $1 billion into the lagging missiles program.

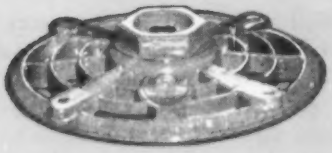
Ike's bid for the hefty extra funds makes it clear that the new money is for immediate spending. The request is completely separate from the anticipated request for an additional $2 billion in defense money to be asked of the Congress in January for military spending in the 12-month period starting next July 1.

Nearly all of the expected $1 billion increase in current spending is for missiles and rockets.

Approval by Congress of the extra $1 billion raises total defense spending for this fiscal year (ending next June 30) to about $39.5 billion.

Most informed Congressmen believe that the new military budget figure for the next fiscal year will be around $40.5 billion.





Two sizes of motor end-plates are assembled, bored, drilled and tapped in a Natco 3-Way Machine.

At Wagner Electric Corporation

One Natco

NATCO

Assembles, Bores, Drills and Taps... Reduces Labor Cost 70% On Small Motor End-Plates

This Natco combination assembly and multi-drilling machine presses a bearing sleeve into the end-plate, rough and finish bores the outside bearing-cap hole, drills an oiler hole at an angle, drills four (4) thru-bolt holes, and drills and taps two (2) 8x32 cover plate holes. *Production is 170 pieces per hour.*

This Natco accommodates two sizes of motor end-plates without changes in the basic rotary-table tooling. In addition to this important versatility the engineers at Wagner Electric point out these other advantages:

- *one operator* controls the assembly and machining from one station.
- *work scheduling* is simplified due to the short machine cycle.
- *in-process inventory* can be kept at a minimum because of high production rate.
- *floor space* is made available for other operations.

Natcos perform all kinds of drilling, boring, facing and tapping jobs in every conceivable combination and sequence.

Ask the Natco Field Engineer about the newly perfected tape control systems for Natco production tools.

National Automatic Tool Company, Inc.

Richmond, Indiana ***Multi-spindle drilling, boring and tapping machines. Special machines for automatic production. Call Natco Offices in Chicago, Detroit, New York, Buffalo, Philadelphia, Cleveland, Los Angeles; distributors in other cities.***

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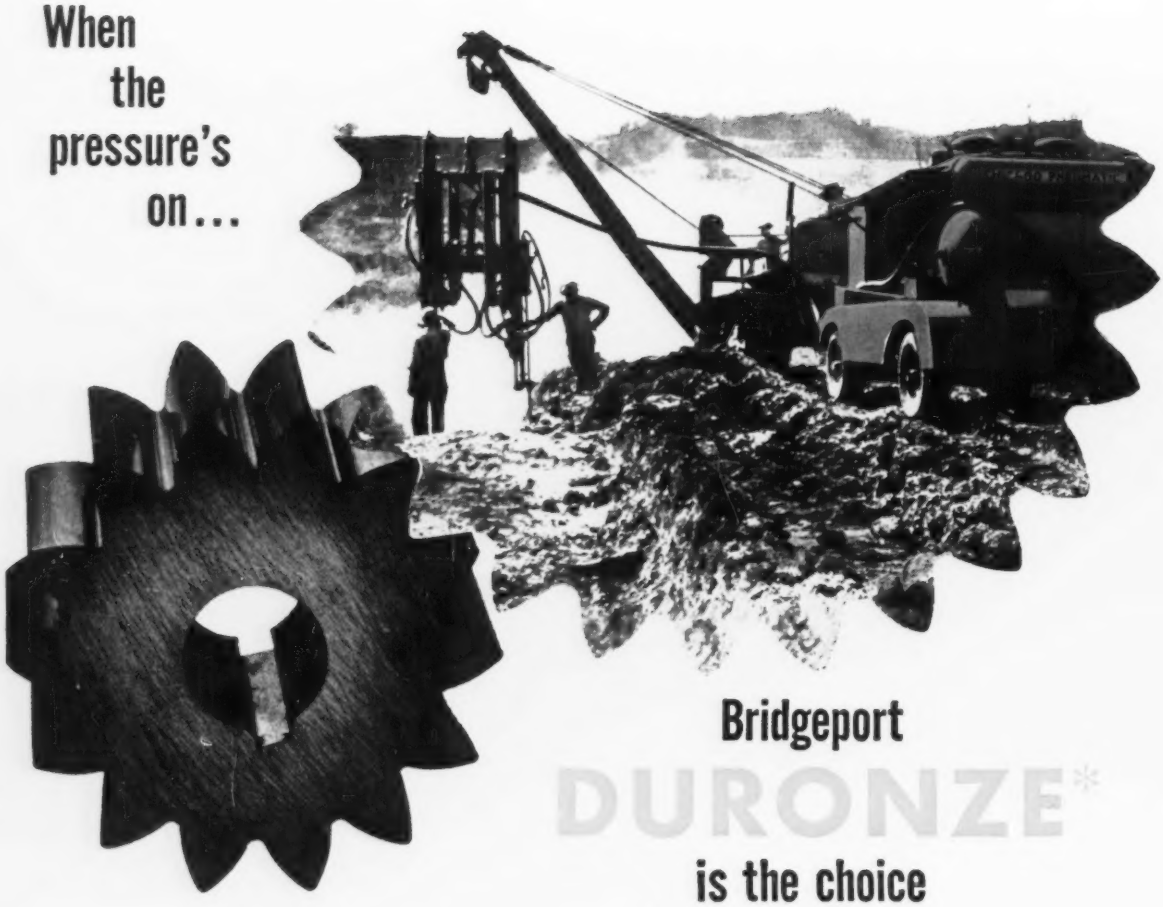

Bridgeport DURONZE* is the choice

*Aluminum Silicon Bronze

Superior wear resistance and good machinability make Bridgeport D· ·nze 707 (Aluminum Silicon Bronze) an ideal material for many products.

Take, for example, its use by Chicago Pneumatic Tool Co., New York, N. Y., in the oil pump gears used in their rotary portable and stationary Class "P" compressors.

These gears pump the lubricating oil which seals rotary compressor vane clearances, lubricates vital parts and also cools the air during compression. In meeting the precise requirements of this job, Duronze's combination of high strength, wear resistance and machinability are equally important advantages.

In the annealed condition, in which it is generally supplied, Duronze has an average tensile strength of 90,000 lbs. per square inch. Its endurance limit is over twice that of Naval Brass and it is generally superior in corrosion and wear resistance.

Duronze is only one of Bridgeport's complete line of copper and brass alloys in sheet, rod, wire and tube, designed to help you meet a wide variety of product and production applications better, faster and more economically. To help you in choosing the right alloy for your specific needs, you can expect and get experienced assistance from your Bridgeport Salesman and from the Technical Staff behind him. For prompt service, give your local Bridgeport Sales Office a call today.

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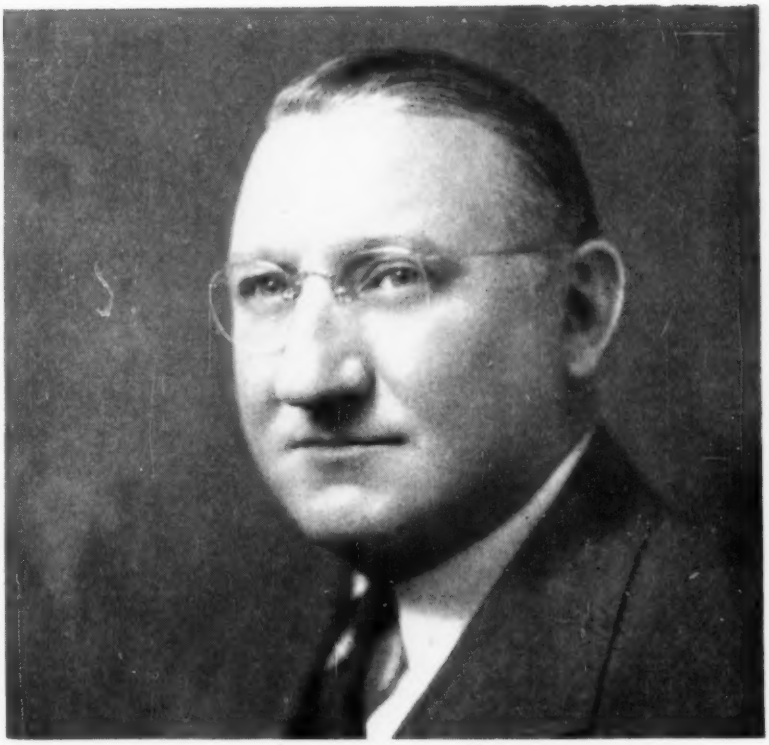
Carl E. Linden

An Inventor Keeps His Spark

Some men, like Carl Linden, were born to create new mechanical devices.

When times change, it is a test of adaptability for them to keep up with new developments.



CARL E. LINDEN: Insist on the impossible.

▪ In this day of automation, special machines, and high speed production it takes unusual inventive insight to come up with a significant improvement for a standard machine.

It is in this area that Carl B. Linden, president of The Fosdick Machine Tool Co., has made his mark. For instance, he welcomed numerical controls as a concept that could be applied to conventional equipment to advantage.

Ideas Pay Off—Under his direction, the company's line of precision hole-making machinery was adapted to punched tape and card controls. He worked with International Business Machines, Inc., engineers to develop the world's first totally automatic jig borer, programmed entirely by tape or card.

In addition, Mr. Linden developed a jig grinder companion to the jig borer. This machine conveniently handles large work that could never before be accommodated on a precision grinder. Then there is a new type radial drill which features new and simpler operator controls.

Started Young—Outside of native mechanical talent, how does a man get the inspiration to create new machine tools? Some of Carl Linden's associates say his "drive" makes the difference. Others claim it's his vision, his scorn for tradition. Mr. Linden's own answer: "Insist on the impossible—don't just expect it."

His story begins in 1916 when, at 23, he was named chief engineer of the Cincinnati Planer Co. He was one of the youngest C.E.'s in the machine tool industry. The choice was a fortunate one for Cincinnati. The young chief soon came up with an open-side planer and a combination planer and milling machine believed to be the first of its kind. Elevated to sales manager in 1927, he showed surprising talent for marketing.

Reaches the Top—In 1933, he became general manager of Fosdick. He went to work developing the first hydraulically controlled radial drill, and later, sensitive drills with gear shift speed change. Then followed a new sensitive radial drill and a variety of special drilling machines for the automotive industry. Also, a spindle which permits tool changing in less than 10 seconds.

Last year, Mr. Linden was made president of Fosdick, concurrent with its purchase by The R. K. LeBlond Machine Tool Co.

Retiring—On Jan. 1, Carl Linden will retire after 42 years in the machine tool industry. To the men who have worked with him, his outstanding mechanical contributions to industry are overshadowed by his spirit of inventiveness and determination. While he "insists on the impossible," his friends say, "a kindlier gentleman you could never hope to meet."

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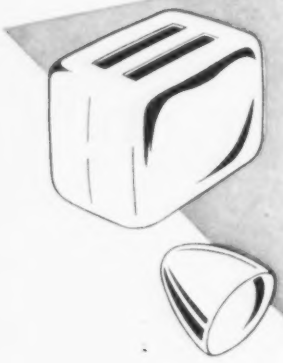
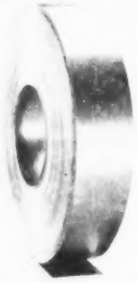
COLD ROLLED STRIP STEEL

Serves Typical Low Carbon End Use Requirements Such as these . . .

SIZE	8 x .045
ANALYSIS	1010
FINISH	#2 finish
HARDNESS	Non-Scalloping quality
THICKNESS TOLERANCE	± .0005 Incl. crown
WIDTH TOLERANCE	± .005
COIL SIZE	250# per inch of width
PACKAGING	Skidded



SIZE	12 x .032
ANALYSIS	1010
FINISH	#3 finish
HARDNESS	#4 Temper
THICKNESS TOLERANCE	± .0005 Incl. crown
WIDTH TOLERANCE	± .005
COIL SIZE	up to 200# per inch of width
PACKAGING	Paper interleaved—skidded and shrouded



SIZE	4 x .065
ANALYSIS	1010
FINISH	#2 finish
HARDNESS	#3 Temper
THICKNESS TOLERANCE	± .0005 Incl. crown
WIDTH TOLERANCE	± .005
COIL SIZE	Cut lengths
PACKAGING	Skidded

Many times, by varying processing methods, J&L is able to develop properties in cold rolled strip steel which greatly facilitate production operations and/or give the product superior qualities without adding to end product cost. End result is lower costs through improved products or better assembly and improved yield. We believe you will find it worthwhile to investigate the possibilities of J&L Restricted Specification Cold Rolled Strip Steel applied to your production.

THE 4 IN 1 SOURCE FOR YOUR COLD ROLLED STRIP STEEL

Now there are four J&L plants with facilities for production of "Restricted Specification" cold rolled strip. Strategic locations at Youngstown, Indianapolis, Los Angeles and Kenilworth, N. J., provide the security of 4 sources of supply plus the close working relationship which these local production centers make possible.

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FORMERLY THE COLD METAL PRODUCTS COMPANY

Is Business Caught in a Cycle?

Business actually looks worse on the surface than it really is. Many industry rates do not reflect the overall economy.

Steel is a leading example. Its operating rate is far below the rate of its leading customers.

▪ The immediate business outlook continues on the slightly grim side. The Federal Reserve Board's Index of Industrial Production sank to 139 in November. This is the lowest point since the summer of 1955.

Furthermore, it will be a point or so lower when December is tabulated, with the outlook for January and February about the same. Possibly the Index will drop a point or two a month for a short period.

What's Behind It? — There are definite reasons to believe the economic backsliding will be of a short-term nature. But, at the same time, the downtrend that is going on can stand some close scrutiny. At first glance, it looks like the old business cycle at work.

The blame can't all be placed on tight money and the tapering off of capital spending. In the first place, capital spending has continued at its record rate almost through the full year. In fact, capital outlays in the third and fourth quarters were higher than actually predicted.

Two Types of Buyers — That's small consolation, however, because a significant decline is indicated next year. First quarter, 1958, capital outlays are expected to reach an annual rate of only $35.52 billion, compared with the 1957 rate of about $37.00 billion.

In evaluating the current business slide, there are two separate sides of the picture: Consumers' goods and producers' goods. The two do not necessarily follow the same set of factors in the short term.

Slightly Down—Consumer buying, particularly of durable goods, appears to be in a moderate downward cycle. Most hard goods, except new products that have not yet reached the saturation point, are in slightly depressed markets. It's too early to really evaluate the auto market, but it is about the same pace as the past two years.

Until very recently, the economists took considerable comfort in the record spending for non-durables. There is now evidence that this is in for a downtrend too, with non-durable manufacturers dropping off several points recently in the production index.

Why Steel Looks Below Par

The Figures Show—The production indexes show something even more significant than the mild decline in consumers goods. The index of the steel industry has dropped more than any significant element of the economy. (The exception is the aircraft industry, which is caught in the inevitable defense changeover.)

What's the significance? It shows the extent to which steel is caught in a severe inventory cutback pocket. The decline in steel is many times greater than the drop for any of its significant consumers.

Like 1954—In this respect, the situation is similar to the one that began late in 1953 and extended into 1954. Steel's customers are operating at almost the same rate as a year ago, but are buying considerably less steel, in many cases.

More Strength in Late '58

Slow First Half—How long will the overall business decline last? Probably into the second half of 1958.

The business cycle is definitely down. Some industries, notably the steel industry, look a lot worse today than the overall business picture indicates.

Defense Spending Coming—The most looked-for shot in the arm is in accelerated defense spending. However, because of the emphasis on expensive, but low production missiles, the extra $3 billion pumped into the economy by the defense budget will have a latent, rather than immediate, effect on business and metalworking.

Many top business leaders believe there is nothing wrong with the business picture that more aggressive marketing won't cure. However, that's generally what happens when any industry gets into a cycle that can't be easily explained by looking at indicators.

Will Electric Cars Come Back?

Advances in Solar Energy Conversion Revives Interest

It looks like the auto industry will one day be able to harness the sun's light.

How soon the technique will be adapted depends to some extent on size of the world's oil reserves.—By H. R. Neal.

▪ A sizable group of early American cars shared a number of desirable characteristics virtually unknown in today's modern vehicles. Exhaust wastes were not a problem. High octane fuels weren't required. And they were silent. They were the "electrics."

These cars had such names as Argo, Bachelles, Hercules, Studebaker, and Waverly. While long-gone from the auto scene, it has been predicted that they—or something like them—will return. When and in what form are the points of controversy.

Gas Engine's Fate—Surely gasoline powered vehicles won't disappear overnight, but solving a few problems might bring non-fossil fuel powered transportation sooner than expected.

The heavy lead battery that characterized these early electrics appears to be out as a source of power. But so does the newest energy source—nuclear power. What will hasten the disappearance of the automobile engine as we know it today? The answer, according to several experts, is knowledge.

Resources Depleting—Louis H. Roddis, Jr., deputy director of the Atomic Energy Commission, believes the world is running through its fossil-fuel reserves—coal, oil and gas—faster than it realizes. He estimates these fuels will last from 200 to 300 years at most and "very possibly much shorter than that." And, he noted, we are using more fluid fuels which are in shorter supply than solid fuels.

Mobile engines in automobiles, trucks, buses, trains, planes, ships, and other conveyances account for 22 pct of total energy used in the U. S., Mr. Roddis said. But the largest use from this group is for road transportation—an area that atomic energy is least likely to provide direct help.

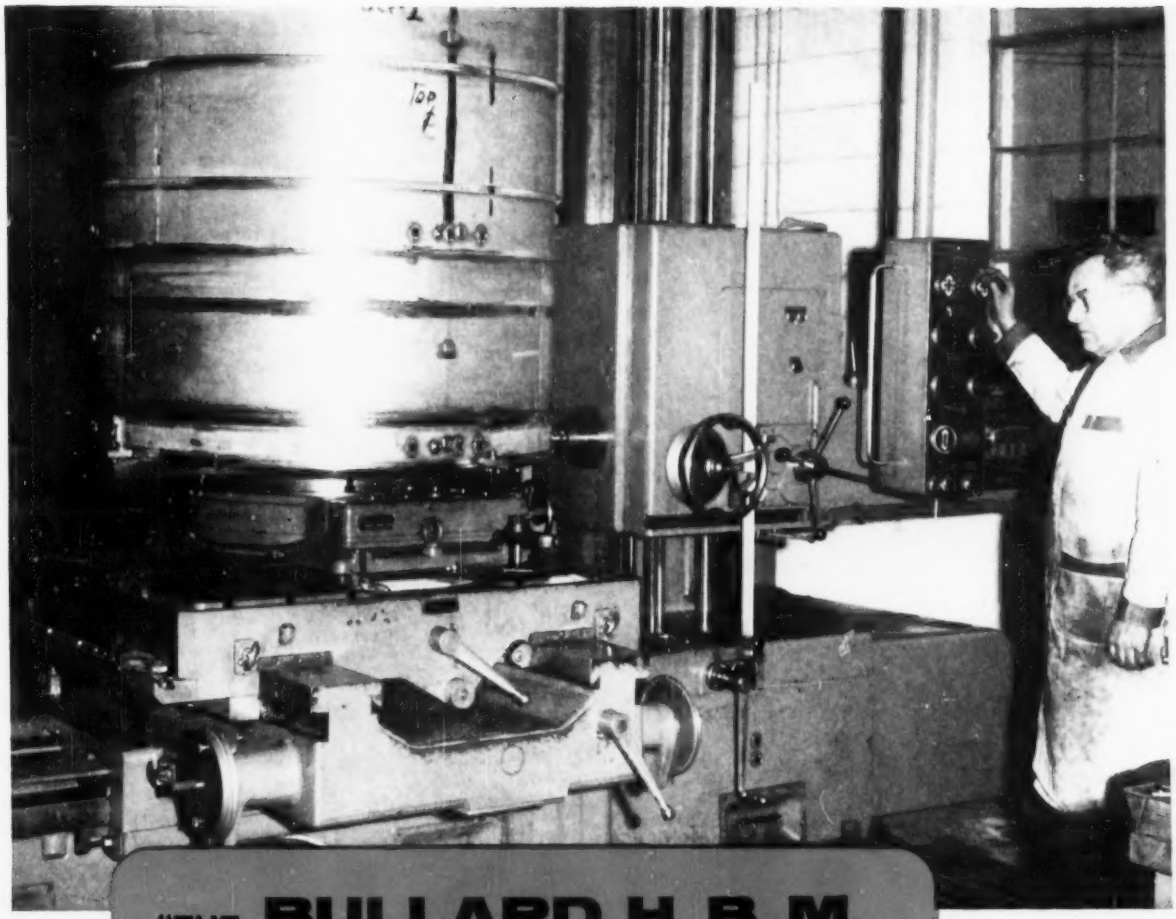
Too Heavy—The main obstacle in adapting nuclear power to a compact engine is the need for shielding to contain radioactivity, Mr. Roddis explained. Shielding adds great size and weight since the materials must be dense.

He then offered a guess as to what the future might bring. "The electric battery driven automobile may one day return in force," he said.

Look to the Sun—This possibility receives strength, after a fashion, from the auto industry. Some auto men agree in principle, but not in method. One of these is James C. Zeder, vice president of Chrysler Corp.

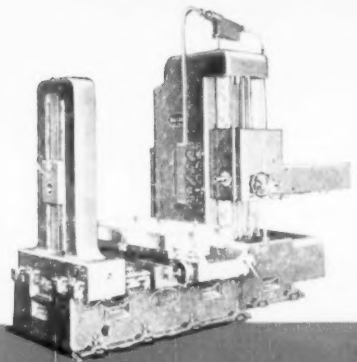
"We know how to get electrical energy from sunlight by means of silicon converters," he said. "If we continue to increase the efficiency of these converters, and if we are able

SUNMOBILE: General Motors has developed this model car powered by a tiny solar engine. Time exposure shows car in action. An engineer holds a 150 watt lamp simulating the sun over the car's hood.



"THE BULLARD H. B. M. MODEL 75 is the best on the market"...

"And yet it costs no more than others. Our accuracy is much improved . . . and production has increased 20%—and business is up by at least 20% . . . these factors mean higher profits. The Bullard H. B. M., Model 75 will pay for itself many times over."



Bullard 3" Horizontal Boring, Milling & Drilling Machine, Model 75 one of four models in the complete line.

This statement by the owner of a leading job shop in the Detroit area is typical of the benefits derived when modern Bullard Machine Tools are applied to machining methods and problems.

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Automotive Production

WEEK ENDING	CARS	TRUCKS
Dec. 21, 1957	139,356	21,466
Dec. 14, 1957	145,503	22,636
Dec. 22, 1956	154,832	22,903
Dec. 15, 1956	158,431	24,117
TO DATE 1957	6,007,500	1,072,000
TO DATE 1956	5,715,176	1,084,500

*Preliminary Source: Ward's Reports

to develop small, efficient energy storage cells, it's possible that sometime before the end of the century, the automobile industry will be producing cars driven by solar power."

GM Concurs — General Motors Corp. offers evidence of the feasibility of sun-powered vehicles to back up the Chrysler executive's forecast. For several years GM's traveling science show has featured a small, plastic model car powered by sunlight.

The Sunmobile depends on eight photovoltaic cells located on its hood for its operation. These cells, made up of hermetically sealed silicon wafers, convert light energy into electrical energy. Each cell produces about one-half volt of direct current when light falls on it. They are connected to a small electric motor mounted inside the 15-in. car which moves the auto by a chain drive.

The Timetable—The silicon crystals are made with an imbalance of electrons between two layers. When light strikes the silicon, it causes an electron flow in a perpetual attempt to balance the negative and positive electrons.

Despite the growing progress made in developing new energy sources, there are a number of factors that continue to temper the timetable for shifting away from liquid fuels. As noted, fuel reserves seem adequate for the foreseeable future.

A Rebuttal—John M. Campbell, scientific director of GM's Research Staff, points to the progress made in the past quarter century with automobile engines. Efficiency of the American automobile engine has increased approximately 50 pct in the last 24 years, he said.

The GM scientist cited ton-miles per gallon figures then and now. A car with a 1933 engine using 1933 fuels averaged 26.7 ton-miles per gallon while its 1957 counterpart registers an average 39.8, he pointed out. A ton-mile is the ability of a gallon of gasoline to move a ton of automobile one mile.

Praises Gasoline—Mr. Campbell participated in many GM Research Staff pioneering studies of fuel chemistry. He said that as far into the future as anyone can predict, gasoline is likely to remain the predominant transportation fuel. He gave three reasons for this:

Raw materials appear adequate in spite of the transportation industry's rising appetite.

Gasoline is easily transported from the refinery to the automobile engine.

It has the highest per pound combustion heat of any known substance that is liquid at ordinary temperatures and is still not harmful.

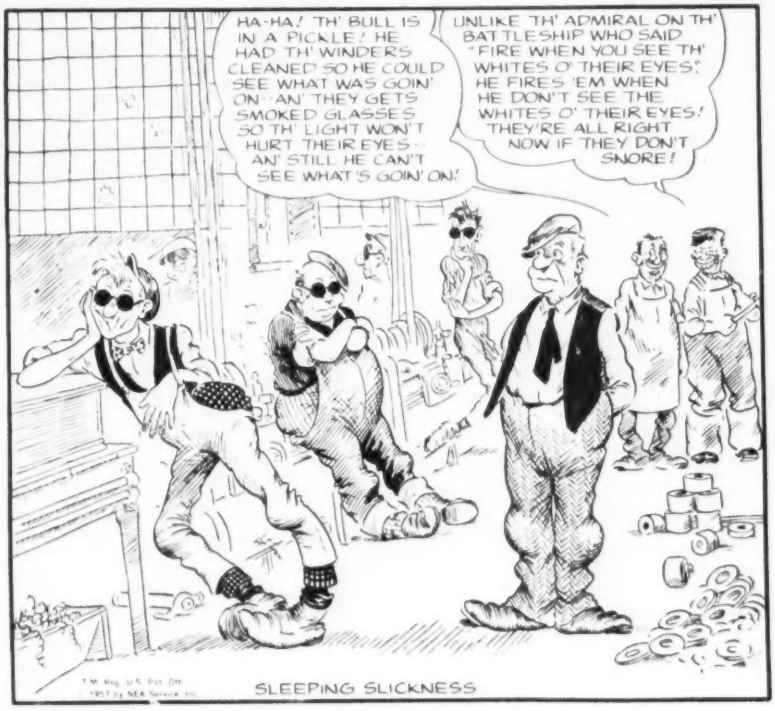
Atoms Are Out—He joined Mr. Roddis and Mr. Zeder in dismissing nuclear energy for automotive transportation. It is so far in the future "that it would seem meaningless to speculate upon what form it might take when it may ultimately be needed," he said.

Battery powered cars are out too, according to Mr. Campbell. "Conversion of nuclear power into electrical energy for charging a storage battery would be possible. But the electric battery-driven car was in vogue 50 years ago and for several reasons was not competitive with gasoline power."

Time Enough — He agreed on solar energy as a power source for the future. "We have some encouragement from our knowledge of electrochemical and thermoelectrical processes. In preparation for the time when our fuel reserves begin to run low, we must have ready some means of utilizing either solar energy or nuclear energy on a large scale."

But even with these possibilities the fundamental problem is energy conversion from heat and radiation to electrical and mechanical power.

THE BULL OF THE WOODS



These Cincinnati setup timesavers

keep your setup from showing on the cost record

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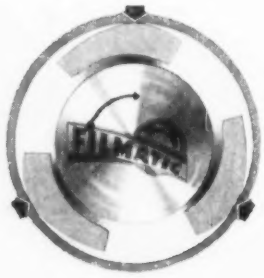

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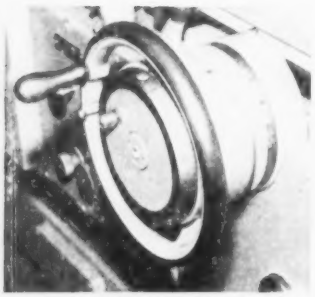

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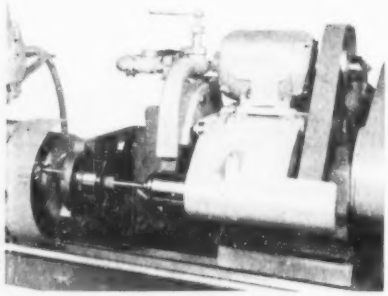

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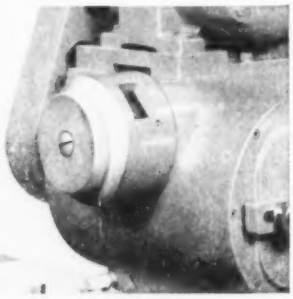

Small manufacturing quantities may be good for inventory accounting, but they're tough on costs. In precision toolroom grinding, CINCINNATI® FILMATIC Universals offer several ways to eliminate or greatly reduce the setup element of cost.

1 **Power rapid positioning** of wheelhead. Saves time and energy, especially when setting up for widely varying diameters (extra equipment).

2 FILMATIC **grinding wheel spindle bearings** require no adjustment for any job assigned to the machine.

3 **Two-speed cross feed mechanism** facilitates multiple diameter grinding; incorporates pickfeed all the way to final size.

4 **Internal grinding unit** is hinged at the front of the wheelhead casting, always ready for internal work.

5 **Instant work speed selection** for the diameter being ground. Just turn the dial with one hand, that's all there is to it.

Other ways in which new CINCINNATI FILMATIC 12", 14", 18" Universal Grinders can reduce costs in your shop are outlined in catalog No. G-663-2. May we send a copy to you? You will find brief specifications in Sweet's Machine Tool File.

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Congress Needs a Lot of Courage

If Next Year's Budget Is to Be Balanced

It won't be easy for any congressman to vote against veterans' benefits, for example.

But the budget can be balanced if nonessentials are cut down.—By G. H. Baker.

■ The answer to whether or not the government will operate in the red next year is going to hinge directly upon whether or not the Congress will be willing to trim nonessential federal programs out of the budget.

If Congress has courage to end such costly programs as free medical treatment of ills not connected with military service and payments to farmers for crops not grown, then the military services will be able to spend an extra $2 billion for missiles and rockets without knocking the budget out of balance.

Who Has Courage? — But whether or not the Congress will have the political courage to shut off the so-called nonessential programs next year remains to be seen. It will take a lot of political guts to cut off the gravy train, for 1958 is a congressional election year.

Republicans are planning an all-out drive to win back control of the Senate and the House. Democrats are equally determined to hold their majority position, and perhaps even to widen their lead. And candidates from both parties will promise "pie in the sky" for everybody in the drive for votes.

Cannon Says So—The man who probably knows more about government spending than anyone else in Congress, Rep. Clarence Cannon, D., Mo., chairman of the House Appropriations Committee, says flatly the budget can stay balanced if Congress will strike out nonessential, low-priority projects from the budget.

Some insiders say the much-talked-about $2 billion increase may never come. They predict, instead, that the over-all rise won't be much over $1 billion. We'll all know by mid-January, when the new budget is released.

Tax Cuts Unlikely—Here's new evidence that taxes will stay high in 1958: The taxwriting House Ways and Means Committee, which will hold several weeks of public hearings on the need for tax revision, has decided to call in top Administration officials to explain the government's urgency for all the revenue it can get.

Earlier, the plan had been to listen only to businessmen, all of whom are seeking favorable revision or reduction of the rates applying to their firms.

Businessmen Know It — The strategy of calling in Administration leaders is, of course, calculated to set the stage for keeping all existing tax rates in effect. The Administration men will explain that the government's need for funds to investigate space travel, to develop new rockets and missiles, and to carry on the government's so-called civilian functions is such that tax cuts are unthinkable—at this time.

As a matter of fact, a number of businessmen who earlier had requested time to appear before the committee to testify for tax reduction now are sending cancellations to the committee. They sense what is obvious—that tax cuts won't be voted in 1958 and they are reluctant to waste their time on a lost cause, as now appears to be the case.

Who Will Get That $2 Billion?

Air Force Wants All—The Air Force is trying to spread the idea that all of the $2 billion increase in defense funds will be earmarked for the Air Force. This is not likely, however.

Actually, the total rise of $2 billion will be distributed among the Air Force, the Army, and the Navy, with the lion's share (a little over $1 billion) going to the Air Force.

It Won't Get It—What Defense Secretary McElroy actually said in November was that the Defense Dept. may have to spend an undetermined number of millions of dollars more for ballistics missiles next year. The Air Force is now trying to give the impression that all of the extra money will be earmarked for it, and that there is no contemplated rise in spending by the Army or Navy.

Not so. The increase will be divided among the three military services in about the same proportions as in the past. Your opportunities for obtaining government contracts are to be as good with the Army or Navy as with the Air Force.

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Alive today . . . because they went to their doctors *in time!* Every year more and more Americans are being cured of cancer. But the tragic fact, our doctors tell us, is that every sixth cancer death is a *needless* death. So many people just don't consult their doctors when the disease is in its early . . . and therefore more curable . . . stage.

Let's give our doctors a chance to head off cancer in time! Form the life-saving habit of a head-to-toe health checkup once a year. For men, this should include a chest x-ray; for women, a pelvic examination.

Make it a habit . . . for *life*.

AMERICAN CANCER SOCIETY

Coast Steel Buying Will Slide

Users Expected to Pare Inventories in '58

Shipments from Farwestern steel mills will probably decline about a million tons in the coming year.

Fewer orders due from such users as aircraft, construction, machinery, railroads, and ordnance.—By R. R. Kay.

▪ Here's how 1958 steel business will probably shape up in the 11 Western States.

Mill shipments should drop from 7.8 million to 6.8 million tons—a net loss of one million tons.

Consumers on the Coast will live off their inventories. After many years of chasing elusive metal, manufacturers have built up good-sized stores. Now that there's plenty of steel around, they feel no pressure to reorder.

Capacity Hike Due—Watch for mills and warehouses to carry a bigger share of the consumers' inventory—surely for six months at least.

On top of this, Farwestern steel mill capacity is due for a giant hike in 1958. Here's what's coming in: (1) a substantial addition to the Geneva (Utah) Works, Columbia-Geneva Steel Div. of U. S. Steel; (2) Kaiser Steel's 1.5 million tons of new capacity—almost doubling the firm's output; and (3) Bethlehem Pacific Coast Steel and Colorado Fuel & Iron will have increased facilities.

Rundown by Markets—Columbia-Geneva Steel's commercial research manager, Robert E. Oliver, sizes up the 1958 market this way:

Construction industry. May register a real slowdown in coming months. Almost half the steel used in the West ends up in construction. That's 20 pct more than the national average.

Manufacturing. Will have its ups and downs. Mr. Oliver forecasts better business for electrical machinery and equipment, shipbuilding and ship repair, and equipment for oil and gas drilling.

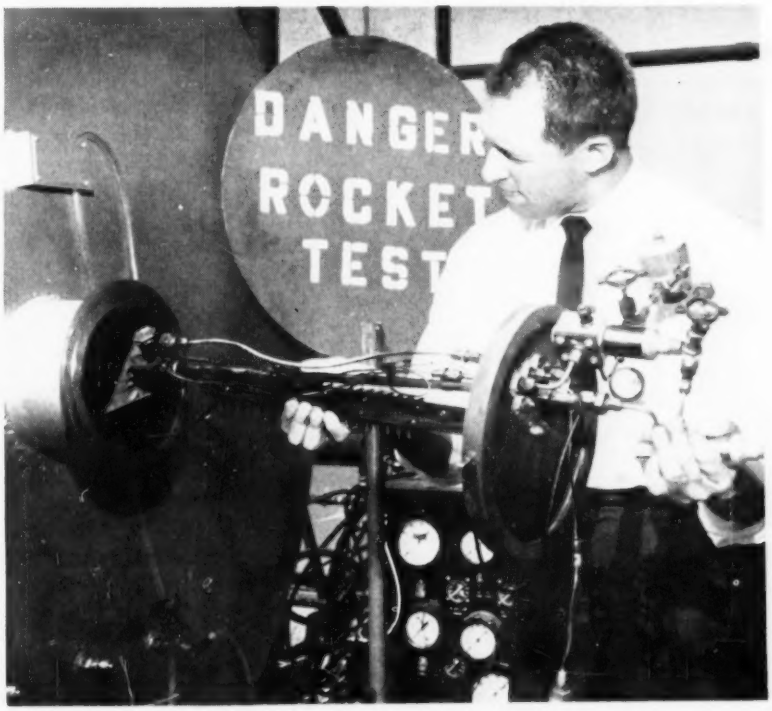
Machinery, aircraft and ordnance. Will do a lot less steel buying in 1958. However, durable goods will be down only slightly.

Railroads. Due for a 25 pct drop in steel buying for new equipment and maintenance of right of way. Railroads are the largest users of steel in the West's transportation industry.

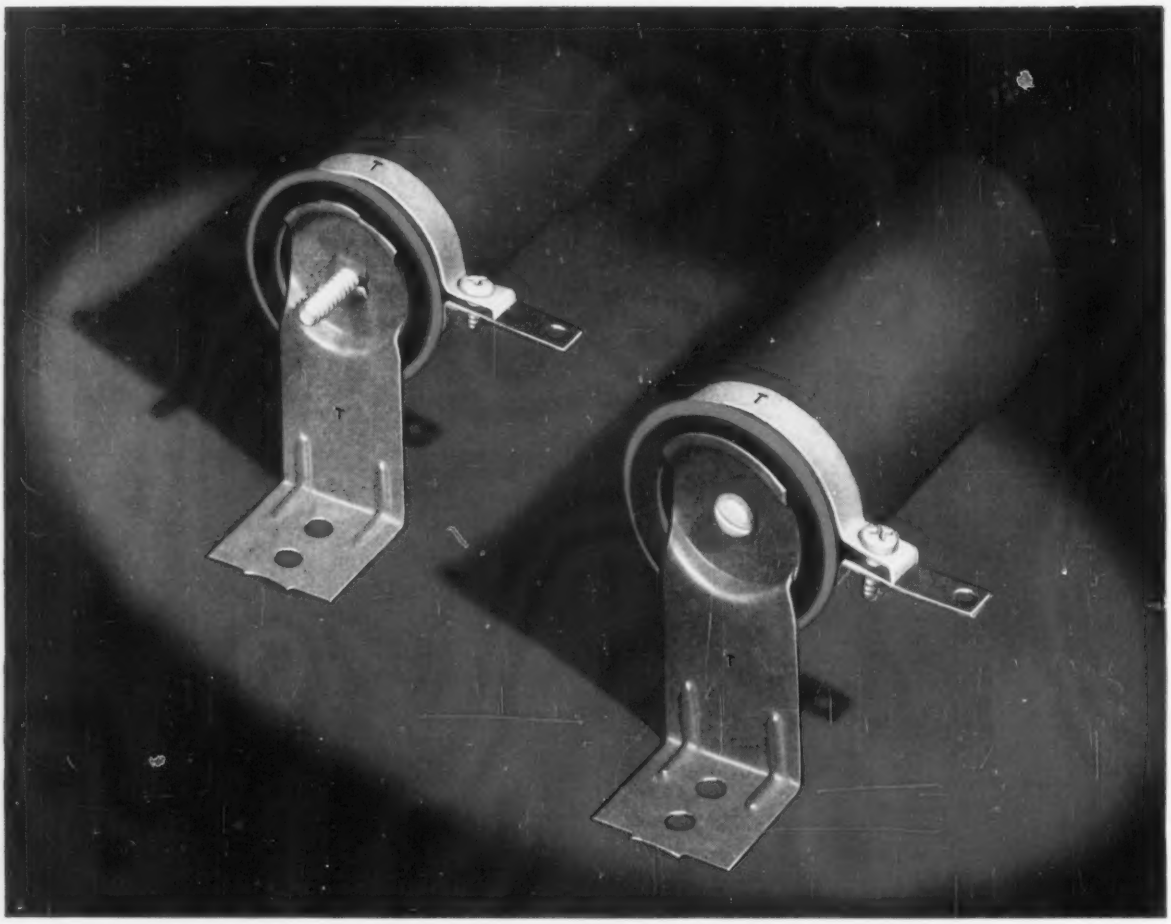
Yuba Makes a Buy

Watch for Yuba Consolidated Industries, large San Francisco area metalworking firm, to buy Isaacson Iron Works, Seattle. The 50-year-old Pacific Northwest firm is one of that region's largest steelmaking and fabricating companies. Two electric steel furnaces can make 102,000 tons per year.

High Altitude Testing at Ground Level



AIRLESS TANK USED: Testing of miniature rocket assembly in tank from which air is pumped enables engineers at Convair Div. of General Dynamics Corp. to study behavior of rocket exhausts at high altitudes.



Engineered by Tinnerman...

4 SPEED NUTS® eliminate 8 parts in resistor assembly, cut costs 50%!

Tremendous assembly savings are often possible when Tinnerman SPEED NUTS are "designed into" new products. This is an example: Corning Glass Works, Corning, New York, adopted 4 special SPEED NUT brand fasteners and cut assembly costs on new power-type glass resistors by 50%!

Assembling power resistors is normally a slow and complex operation. Yet a pair of one-piece, spring-steel SPEED NUT angle brackets eliminated 4 of the 9 parts required by another fastening method and cut assembly time to a few seconds!

These corrosion-resistant, vibration-proof fasteners hold the resistor under live spring tension to avoid mechanical shock. Locating washers, lock washers and nuts are eliminated. Also, one-piece SPEED CLAMPS® that double as terminal bands eliminate 2 lock washers and 2 nuts.

SPEED NUTS permit maximum assembly savings on *new* products, but you can probably make worthwhile savings *right now* on current products. Over 8000 types available. See your Tinnerman representative or write for Bulletin 333-1.

TINNERMAN PRODUCTS, INC.
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TINNERMAN

Speed Nuts®

FASTEST THING IN FASTENINGS®

CANADA: Dominion Fasteners Ltd., Hamilton, Ontario. GREAT BRITAIN: Simmonds Aerocessories Ltd., Treforest, Wales. FRANCE: Simmonds S. A., 3 rue Salomon de Rothschild, Suresnes (Seine). GERMANY: Mecano-Bundy GmbH, Heidelberg.

Tough Alloys Stump the Experts

They Puzzle Over Ways to Increase Cutting Speeds

Companies who are working with super-hard metals have learned a super-hard fact.

Cutting speeds must be reduced sharply if tools are to hold up.—By E. J. Egan, Jr.

▪ Unless something gives—soon—makers of key parts for missiles and supersonic aircraft say they face a 25-year backward shove in machining speeds.

An array of high-strength, heat-resistant materials is behind this big reverse push. One by one, they're crowding out many of the easily machined aluminum components that are fine for subsonic planes, but can't stand the heat gaff of supersonic travel.

Tough Cutting—It's been no trick at all in recent years to machine these aluminum parts at average speeds of 1500 sfpm. But try to turn or mill the same part designs out of stainless steel, titanium, or one of the nickel, cobalt or molybdenum base alloys. You just don't cut these super materials that fast. More likely, you nurse them along at about 65 sfpm.

That's just about the speed used back in 1932 for machining mild steel. And when an airframe producer says he works in this low speed range and has to make chips out of 77 pct of a particular titanium forging, the situation is serious.

More Precision Coming—What's being done about the problem? According to Alfred H. Peterson, producibility methods engineer for Lockheed Aircraft Corp., "attempts are being made to produce semi-finished products more nearly to the actual sizes required." But he adds, "the job is moving slowly and causing grave concern."

No-draft forgings with thin webs and precise tolerances are a potential and partial answer to the chip-making problem, of course. So are thin, wide-profile extrusions. But Peterson assumes that super-alloy parts formed in such ways will not be widely available in the immediate future.

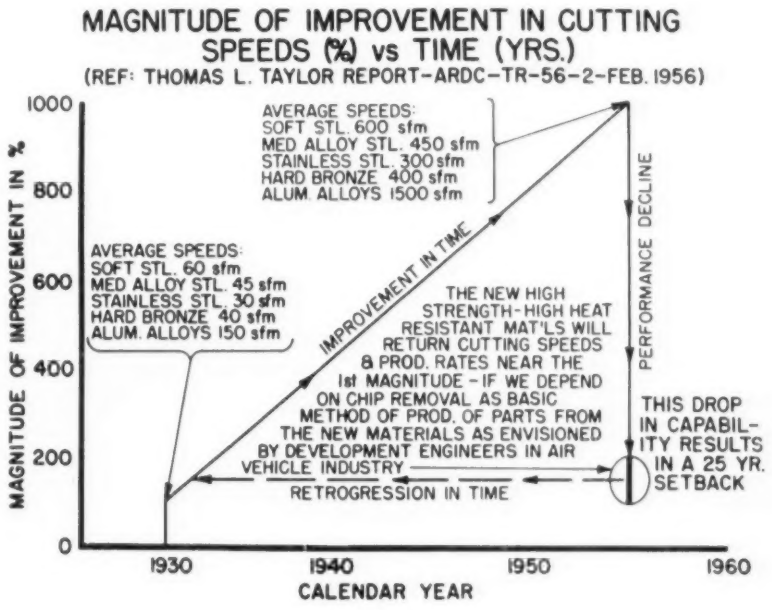
Courses of Action—If the assumption is correct, he says, "then one of three things must be done: Provide much larger machining facilities throughout the country, design to reduce the amount of machining, or find new ways to machine."

He dismisses the first premise as "economically abhorrent." The second plan involves such things as sandwich-type construction, and heat-resistant coatings on more easily worked alloys. In both techniques, the state of the art is not very far advanced.

Enigma Persists—New ways to machine are highlighted by chemical milling, ultrasonic, electrolytic discharge, and power-roll forming techniques. But Peterson thinks it is a "rather remote" possibility that any of these methods will generally replace machine tools for making large, complex parts.

Chemical milling is not suited to boring large holes, or removing large masses of metal from complex shapes. And the degree of oxidation, embrittlement or decarburization produced by electrical and electrolytic methods is not too well known at present.

Thus the problem persists: How to cut excessive machining time on super-hard, super-tough metals and alloys.



INDUSTRIAL BRIEFS

Commission Granted — Admiral Brass & Copper Co., Cambridge, Mass., has been appointed distributor of aluminum wire, rod and bar products by Reynolds Metals Co. Admiral will distribute the aluminum products in the New England area and in a portion of New York State. The company, founded in 1950, also markets brass, copper, bronze and beryllium products.

New Chapter—West Coast screw machine product firms have established the newest district of the National Screw Machine Products Assn. of Cleveland. The district covers the states of California, Oregon, and Washington. The Association is composed of some 270 producers of screw machine products in the U. S. and Canada, whose output comprises about 70 pct of total national production.

Paired Off—Wetzel Tool Sales Co. has been appointed stocking distributor for Detroit Tap & Tool Co. products throughout Maine, New Hampshire, Vermont, Massachusetts, and Rhode Island. "Detroit" brand tools will be stocked at the company's Springfield, Mass., office. These include general purpose and "specific" taps, thread gages, and drills. Solid carbide tools can be supplied on request.

"Sam likes to spend the lunch hour in solitude."

By the Numbers — The annual short course in Quality Control by Statistical Methods will be held March 10-20. It is being offered by the College of Engineering, University of Illinois, with the cooperation of the Div. of Engineering Extension at Urbana. The course is designed for those in areas of design, production, procurement, management, quality control and inspection.

Like Lincoln, Oui—A new arc welding materials and machine manufacturing plant, modeled after The Lincoln Electric Co.'s Cleveland, O., plant, is under construction at Grand Quevilly, near Rouen, France. It will initially include 135,000 sq ft of covered area with possibilities for a tripled expansion. Distribution of products will be through the Paris headquarters of the Armco International Corp., Middletown, O.

Merge Dirge—Proposed merger of Dresser Industries, Inc., Dallas, and Gardner-Denver Co., Quincy, Ill., has been abandoned. The decision follows consultations with Dresser management. A detailed study has revealed that the intended combination cannot be effected on a basis that meets the anticipated benefits and objectives.

Four Stand Fast — Jones & Laughlin Steel Corp. has placed in operation, at its Cleveland Works, a four-stand cold reducing mill for sheet steel. The mill, installed at a cost of $10 million, makes possible production of 70,000 tons of sheet per month. This is about double the capacity of the mill it replaces.

Mississippi Transfer—New plant facilities have been put into full production by the Stephens-Adamson Mfg. Co., at Clarksdale, Miss. The company designs conveying systems, and builds a broad line of bulk materials handling equipment. The plant will make components for conveyor systems which are produced at the S-A Aurora, Ill., manufacturing division. The Aurora plant will use a part of the vacated area to increase production of Sealmaster ball bearing units. Sealmaster is a division of Stephens-Adamson.

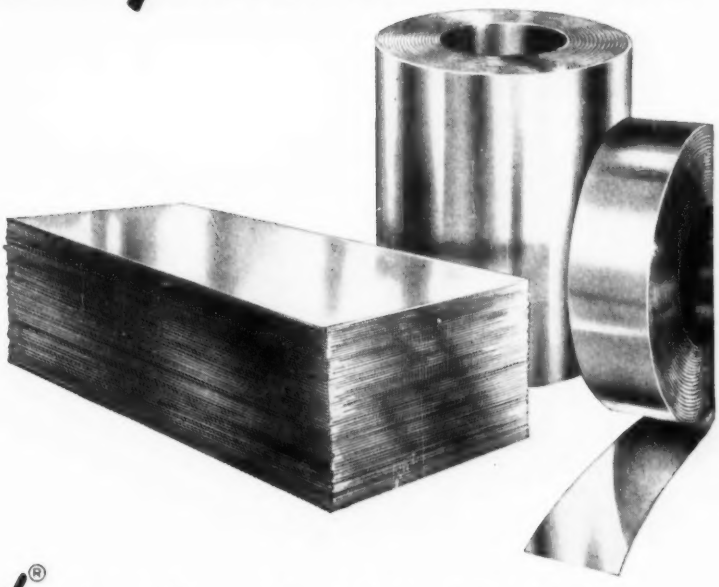
Stepping Out—Dr. Clyde Williams will retire as president of Battelle Memorial Institute on Jan. 1, 1958. Dr. Williams will enter private business. He has formed a new company and has completed arrangements to assist several industries with their technical and business problems. He will continue to serve the Institute as a member of the Board of Trustees and in a consulting and advisory capacity.

How Did We Goof—The Association of Missile & Rocket Industries is polling manufacturers for practical advice on how to speed our missile program. "Main question is how to reorganize our scattered effort which has let the Russians get ahead despite our superior resources," says K. K. Hoyt, Exec. Director. The AMRI canvass of missile companies also will cover specific points regarding government contract problems.

Nichols for Aluminum—Sales of aluminum building materials have been rising for the past several months. According to F. R. Nichols, vice president, The Aluminum Assn. and president of Nichols Wire & Aluminum Co., Davenport, Iowa, the prospect is that 1958 will be "one of the best" the industry has had. His prediction was based on the increase in housing starts already developing and the greater quantity of aluminum being used per housing unit.

Pick Chestnut—During a recent meeting in Paris, France, Harold Chestnut of The General Electric Co.'s General Engineering Laboratory was elected first president of the International Federation of Automatic Control. Mr. Chestnut was one of three U. S. delegates to the organization's first conference. Nineteen nations were represented. The organization's primary objective is to promote the science of automatic control among nations.

Wherever you are you get *quick personal service*



when you order *MicroRold*® Stainless Steel Sheet & Strip

SPECIFICATIONS

	WIDTH	THICKNESS
SHEETS	up to 36″	.005 to .109
	up to 48″	.010 to .109
STRIP	up to 23 15/16″	.0015 to .090
GRADES:	201, 202, 301, 302, 304, 305, 316, 321, 347, 403, 410, 430 and Micro-Mach (special extra-high-tensile aircraft grade)	

Any one of the 305 independent steel warehouse distributors stocking MicroRold Stainless Steel is ready to serve as your *personal* stainless procurement representative. Located strategically in the U. S. A., Canada and Europe, your MicroRold distributor carries a variety of grades, widths, thicknesses and finishes and is fully qualified to assist you in the selection and fabrication of the most suitable stainless grade for your particular requirements.

Your MicroRold stainless steel distributor assures you of the fastest possible deliveries with an absolute minimum of red tape in order processing. If he is unable to fulfill your needs from stock he has available direct and immediate service from our mill. In cases of emergency, it is possible for us to roll and ship MicroRold Stainless Steel the same day the order is received.

You can rely on MicroRold service as a dependable source of supply, either mill or distributor delivery.

Write, wire or phone today for the name of your nearest MicroRold Stainless Steel Distributor.

WASHINGTON STEEL CORPORATION

122-L WOODLAND AVENUE WASHINGTON, PENNSYLVANIA

MEN IN METALWORKING

W. A. Patterson, elected president, The Cleveland Ladder Co., Inc., Cleveland.

W. R. Thomas, elected vice president, finance, Cutter Laboratories, Berkeley, Calif.; **H. A. Eyerly,** named controller.

W. H. Harris, Jr., appointed executive vice president, Micromatic Hone Corp., Detroit.

H. F. Frailey, named operations manager, power and special purpose tubes, Westinghouse Electric Corp., Electronic Tube Div., Elmira, N. Y.

Arthur Colton, appointed staff administrator, National Standards Committee, American Society of Tool Engineers.

T. M. Hogan, appointed New Orleans district sales manager, Jones & Laughlin Steel Corp.

W. J. Pinkerton, appointed administrative vice president, Micromatic Hone Corp., Detroit.

C. G. Tournay, appointed vice president, Great Lakes Steel Corp., Ecorse, Mich.

Davenport West, Jr., appointed vice president, Union Carbide Ore Co.

R. S. Rosenast, appointed production manager, Beckman Instruments' Systems Div., Anaheim, Calif.

P. H. Luckett, promoted to asst. product manager, gas products, Meter and Valve Div., Rockwell Mfg. Co., Pittsburgh.

B. H. Carlisle, appointed general divisional manager, The Clark Controller Co., Cleveland.

C. D. Ramsden, named president and general manager, Pacific Coast Engineering Co., Alameda, Calif.

A. J. De Fino, elected vice president, Hupp Corp.

O. W. Carpenter, elected executive vice president, Chain Belt Co., Milwaukee; **W. C. Messinger,** elected vice president, construction machinery section; **E. M. Rhodes,** elected vice president, industrial equipment section; **G. H. Woodland,** elected vice president, marketing.

W. B. Harris, promoted to manager, western commercial sales, Townsend Co., New Brighton, Pa.

N. E. Bourne, appointed asst. to general superintendent, South Works, U. S. Steel Corp.

R. M. Furlaud, named general counsel, Olin Mathieson Chemical Corp., New York.

Dr. W. E. Hanford, appointed vice president, research, Olin Mathieson Chemical Corp.

L. A. Iacocca, named new car marketing manager, Ford Motor Co., Dearborn, Mich; **Wilbur Chase, Jr.,** named new truck marketing manager.

A. K. Heydrick, appointed education and training director, Link-Belt Co.

W. A. Schlegel, named resident chief metallurgist, Carpenter Steel of New England, Inc., Bridgeport, Conn; **Elmer Schwartz,** appointed general superintendent, Production

Depts.; **James MacMinn,** named superintendent, billet preparation; **J. J. Barrett,** becomes asst. superintendent, hot rolling.

R. L. Puette, appointed general divisional manager, The Clark Controller Co., Cleveland.

A. W. Ackerman, Jr., named asst. to the executive vice president, Huck Mfg. Co., Detroit.

V. P. Blair, appointed general manager, Delco Products Div., General Motors at Dayton, O.

Harold Schulte, appointed manager, production engineering and **Herman Kretz,** appointed asst. manager, production engineering, Cooper Alloy Corp., Hillside, N. J.

A. M. Varner, appointed plant superintendent, Michigan plant, Capac Industries, Inc.

W. H. Leo, appointed manager, sales, Sheffield's Houston plant, Armco Steel Corp.

J. L. Doyle, appointed sales representative, Detroit Gray Iron Foundry Co., Detroit.

R. J. Roe, named engineering representative, Huck Mfg. Co., Detroit.

T. J. Manning, appointed plant manager, Lincoln, Ill. plant, Cutler-Hammer, Inc.

Lloyd Lee, appointed director, automation, LeMaire Tool & Mfg. Co.

K. C. Edson, appointed Los Angeles district sales manager, Kelite Corp.

A. G. Whyte, Jr., appointed general sales manager, Capitol Products Corp., Mechanicsburg, Pa.

J. W. Luoma, appointed technical assistant, Chicago office, Roll Sales Dept., Blaw-Knox Co., Pittsburgh.

F. L. Brugger, appointed product sales manager, metal-cutting tools, Kennametal Inc., Latrobe, Pa.

Virgil Pettigrew, promoted to manager, estimating and controls, Temco Aircraft Corp.

L. L. Grunn, appointed manager, Cleveland, O. plant, National Can Corp.

Alfred Augustine, named director, engineering, Loftus Engineering Corp., Pittsburgh; **E. A. Siemon,** appointed chief engineer; **C. R. Wilt, Jr.,** appointed asst. chief engineer.

E. L. Argo, named manager, sales services, Houston plant, Sheffield Div., Armco Steel Corp.

L. J. Venne, named metallurgical service representative, Sales Dept., Electro Metallurgical Co.

George Gallousis, appointed patents and standards engineer, Allis-Chalmers Pittsburgh Works.

Fred Coker, appointed purchasing agent, Fulton Sylphon Div., Robertshaw-Fulton Controls Co.

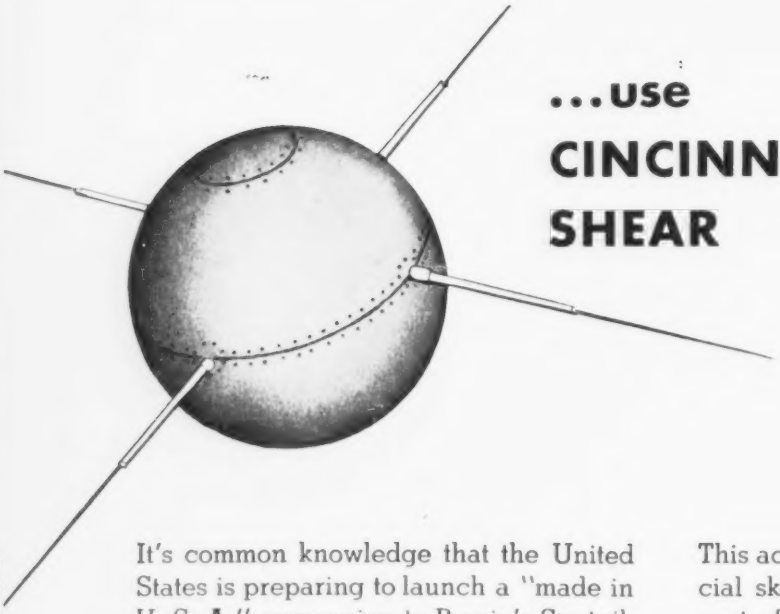
Clyde Lowe, named Cleveland representative, MacDermid Inc., Waterbury, Conn.

E. J. Campbell, appointed sales engineer, Minnesota-Iowa area, K. W. Battery Co., Inc., Skokie, Ill.

L. F. Norris, appointed sales engineer, International Resistance Co., Philadelphia.

Herman Schroll, appointed Detroit branch manager, Die Supply Div., E. W. Bliss Co.

MOON-MAKERS*



...use CINCINNATI SHEAR

It's common knowledge that the United States is preparing to launch a "made in U. S. A." companion to Russia's Sputnik I, and join in the search for knowledge of outer space. The magnesium alloy sphere that will soon be orbiting over us was produced by Brooks and Perkins, Inc., experts in solving difficult metal fabricating problems. And the Shear that cut the blanks that became the sphere is a Cincinnati.

Brooks & Perkins states that performance of their Cincinnati has been "excellent." Their machine, like all Cincinnati Shears, combines micrometer accuracy with high speed operation. Straight and parallel cuts are consistently produced, so accurately that only a micrometer can detect any variation in width of the sheared piece.

This accuracy doesn't call for special skill or manipulation on the part of the operator. As a matter of fact, Cincinnati Shears are built to cut all thicknesses, from thin material up to capacity, ***without changing knife clearance.*** This prevents accidental damage and eliminates interruptions in production.

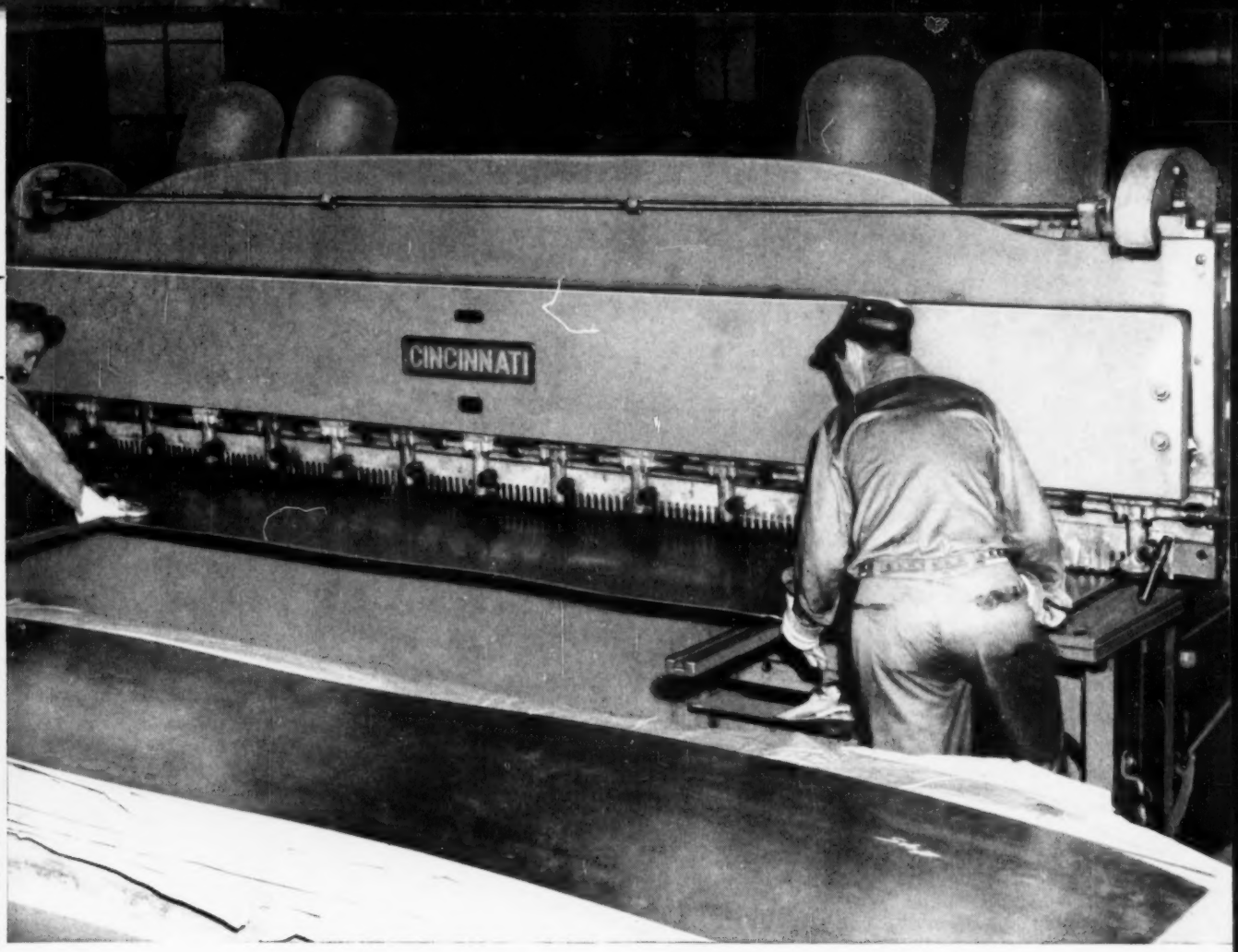
Dependability, equally important, is insured by Cincinnati interlocked construction. No welds are used as load supports, yet the bed is directly supported by the housings. All-steel frame members minimize deflection.

The sketches at the right show a few important features. For full information write Department B for Catalog S-7R.

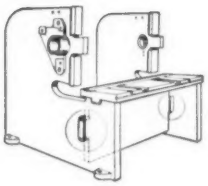
*Photos courtesy of Brooks & Perkins, Inc., Detroit, Michigan

THE CINCINNATI SHAPER CO.

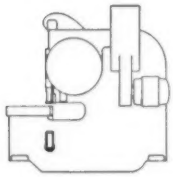
CINCINNATI 25, OHIO, U.S.A. SHAPERS · SHEARS · PRESS BRAKES



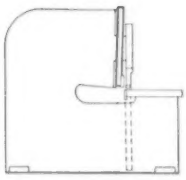
Some Important Standard Features



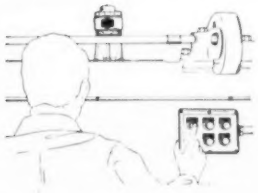
Interlocked construction means no welds used as load supports



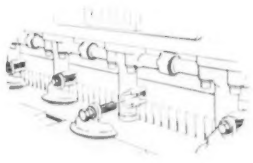
Gap frames allow shearing pieces longer than the machine



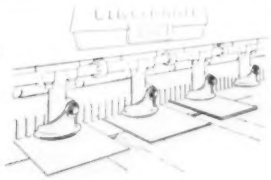
Inclined ram offsets the thrust caused by shearing action.



Front-controlled power back gauge is accurate, fast, convenient.



Hydraulic holdowns exert tons of pressure, insure accuracy.



Different gauges, held with same tonnage, can be cut together.

INVISIBLE LEAD

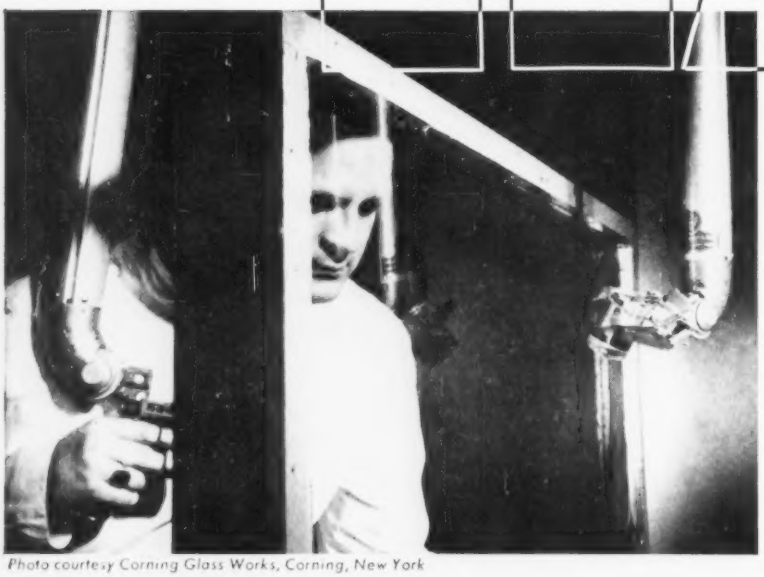


Photo courtesy Corning Glass Works, Corning, New York

...HE SEES, YET HE IS SAFE!

Construction of leaded glass windows recently installed at one of the leading nuclear laboratories.

Lead has long proved its protective value in the field of radioactivity. One of the first problems encountered was to protect the individual against the harmful effects of certain rays. This was accomplished by a *lead metal shield*. But as the field of nuclear activities broadened, it became imperative that operators be able to 'see' what was going on. To work the 'slave' would require visual as well as manual control.

Here, too, LEAD ENTERED THE PICTURE!

Heavily leaded glass is now being used for operational windows. Built of 10 inch thick blocks, such as shown above, these windows will run up to 60 inches thick, depending upon the degree of radioactivity and protection required. Made of the highest quality glass and with a transparency greater than that of the finest sun glasses, these windows provide the necessary high visibility while fully protecting personnel.

Lead, the oldest of metals, is the forefront of the newest in scientific developments: the creation, control and use of nuclear energy.

ST. JOSEPH LEAD COMPANY

The Largest Producer of Lead in the United States

250 PARK AVENUE, NEW YORK 17, NEW YORK

Fast, Accurate Band Machining Avoids Chip Waste

Most machine tools get rid of excess metal chip by chip. Not so the band machine; it removes whole sections at a time.

That's one reason why more and more firms are band machining a wide range of toolroom and production jobs. There are other reasons, too.

▪ Band machining is gaining ground as a way to make duplicate metal parts with a minimum of chip waste. Growing use of the technique for toolroom work, and for both long and short production runs, stems from a recognition of certain unique characteristics:

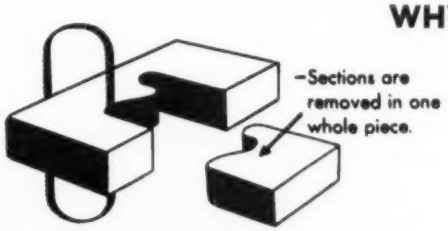
1. Band machines can cut virtually any contour, in any thickness (up to machine capacity) in one pass. Excess material is removed in the form of intact sections, not chips. Cuts can be made internally or externally and length of cut is not limited by table dimension or stroke.

2. The downward cutting force of the saw band serves to "clamp" work to the table. Hold down clamps are not needed for most tasks. Generally, parts are just dropped into a fixture consisting of a back stop and simple positioning guides.

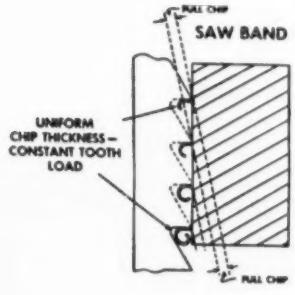
3. Because band saw teeth travel through the work in a straight line, each tooth generates a chip of constant thickness all the while it is in the work. This means maximum cutting efficiency; chip are full and never "feathered out." Linear cutting action also eliminates scuffing and work hardening so that teeth stay sharper longer. And since the saw band moves only in one direction, there are no back strokes to waste time or cause undue wear on teeth.

One-Pass Finishing—Many parts can be shaped directly to finished size with this technique. For example, cutting bands easily follow in-

WHY BAND MACHINES WORK EFFICIENTLY

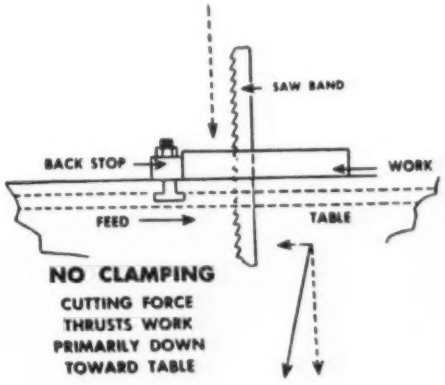


The saw band cuts a narrow path along the outline of a part—reduces a small quantity of metal to chips while removing whole sections—therefore takes less time and power. Wear is distributed over approximately 1500 teeth.



Saw tooth generates a chip of constant thickness through the work because of straight-line advance. Tooth gets no chance to scuff and wear—cutting action fully efficient.

The continuously cutting saw band exerts force primarily downward to hold the work against the table. Hand guiding or simple side and back stops often provide adequate fixturing with no danger to the operator.



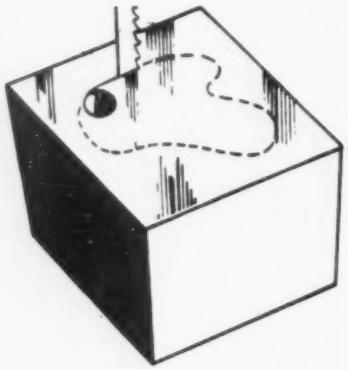
tricate contours to machine cams and other odd shaped parts. Even where finishing must be done on other machines, making a band cut first often saves material, labor and overall time.

Slotting operations are "naturals" for this process, also. The rapidly moving saw band assures the fastest possible job. Simple back stops, side guides or "V" blocks usually take care of all the fixturing needed to make straight, true slots. Machines equipped with hydraulically driven work tables automatically produce slots of the desired depth. And foot controls permit the operator to load the fixture with one hand and remove a finished part with the other as the table cycles.

As for slot width, selection is an easy matter with the wide variety of blades and "sets" available.

No Time Lost—In notching, serrating or recessing, sizeable slugs can be removed in short order be-

BAND MACHINES DO THESE JOBS

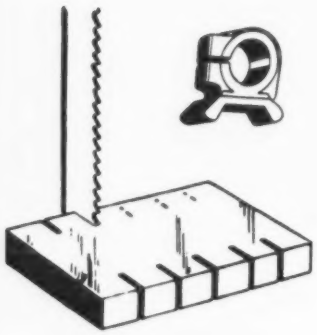


CONTOUR CUTTING

1 High-speed machining action along a *narrow* path permits more rapid and accurate mechanical or hydraulic control of workpiece movement —unwanted material removed in whole section.

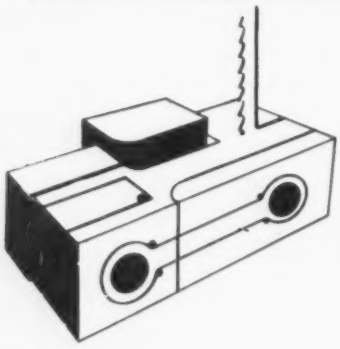
PARTING-ANGLE CUTTING

2 Perpendicular force holds piece against work table — hand positioning or simple miter fixture gives angle — hydraulic or mechanical table tilt gives quick compound angle.



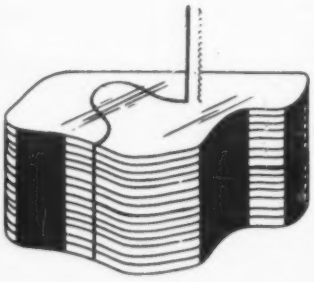
SLOTTING

3 Saw blades in different gages producing wide variety of saw kerfs give broad selection of slot dimensions. Slot rapidly made — simple or no fixtures; adjustable stop on hydraulic table controls length of slot.



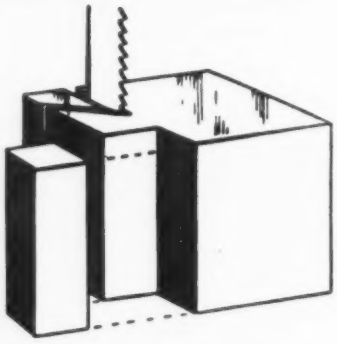
THREE DIMENSIONAL CUTTING

4 Ability to cut straight or contour, internally or externally, permits shaping of complicated mating parts with *one setup, one tool,* and *one machine!*



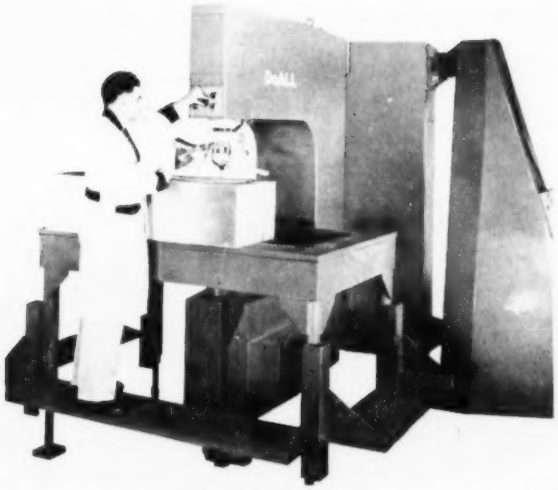
STACK CUTTING

5 Small quantities of "stampings" easily sawed, eliminating expensive stamping dies. Rigid band tool assures uniformity of all parts throughout stack. Perpendicular cutting force simplifies fixturing.

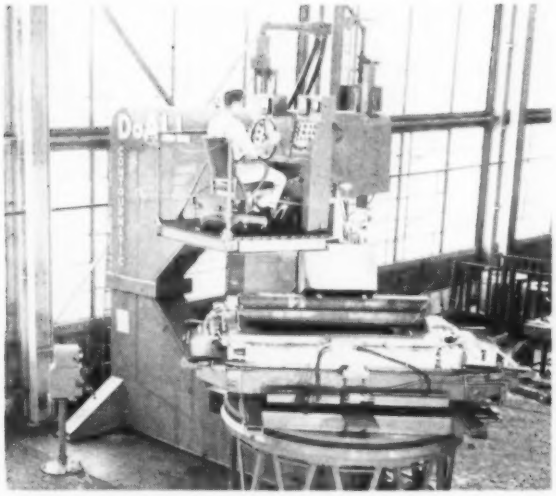


SHAPING

6 Removal of flat or angular sections, a very fast operation on the band machine. Time required to reduce sections to chips is eliminated.



FOR BULKY WORK: Pantographic suspension of sawing frame permits moving over a 50-sq ft area by shifting the blade, not the work.



CONTOUR GIANT: Operator views work through a periscope-mirror arrangement and uses the hand wheel to steer the blade into the work.

cause the waste pieces do not have to be reduced to chips. Big, tough, forging die blocks, for example, can be quickly shanked. Or the complete die impression can be cut smoothly off a worn block so that new cavities can be sunk.

For such large workpieces, machines with extra capacity hydraulic tables are used to make true, straight cuts. Modern machines will handle work of almost any size.

Band units excel in producing a number of straight-cut or contoured parts from stacked sheet or plates in one sawing. The taut vertical band, with a beam strength matching that of a much thicker tool, assures exact duplication of all parts in the stack. Yet for all its strength, the slender saw band is much more maneuverable than bulky cutting tools. In many short run jobs, stack sawing eliminates the need for blanking dies.

Better Band Materials—Development of high speed steel saw bands removed the last obstacle to the use of the band machine as a production tool. Such bands can cut up to six times faster, and with some materials, will last up to 30 times longer than carbon steel bands.

Nevertheless, when these high speed steel tools were introduced, it was clear that existing equipment was neither powerful nor rugged enough to match the cutting loads imposed. The newest machine designs take full advantage of high speed steel band-cutting efficiency. Moreover, they provide the capacity and inherent cutting accuracy to take on ever larger and tougher jobs.

One example of a modern band machine is the DoALL Contourmatic. Such machines are equipped with hydraulic tables. Blade speeds are infinitely variable between 50 and 15,000 fpm. This provides exactly the right cutting speed for a particular type and thickness of metal, from low-velocity sawing to friction cutting. A recirculating coolant system is an integral part of the machine, for either mist or flood cooling.

Automatic Features—Once set by the operator, many of the critical machine adjustments are maintained automatically for unwavering performance. The list includes blade tension, table speed, feed pressure, tool post height, table tilt and speed change.

Modern band machining equipment is not limited to the use of toothed steel bands. On the contrary, these machines can use file bands, bands with abrasive segments or diamond teeth for cutting hardened steels and vitreous materials, knife-edge bands, and abrasive belts for finishing and polishing.

Altogether, a range of 272 widths, pitches (teeth per in.) and "sets" is available to give the modern band machines the utmost metal cutting versatility.

Special Machines—Band machining principles can also be applied to huge or odd shaped metal parts beyond the capacity or capability of standard models. DoALL makes several types of these big, special machines. One is the Band Mill, a rugged unit able to make mill-type straight or slabbing cuts in large blocks of metal at high speed.

Another is the Pan Arm contour machine. Pantographic suspension of its sawing frame permits accurate contour sawing in any direction within a 50 sq ft area. Still a third type involves remotely controlled saws of huge capacity where the work to be cut is positioned by powerful motorized tables.

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Blast Cleaners Treat Parts in Line

Efforts to improve transfer lines often run into snags when it comes to treatments commonly set up as separate operations.

Take blast cleaning. But here it turns out to be easy once you get the right equipment designed to fit in with transfer units.

▪ There's no blast cleaning room in the traditional manner at Saginaw Steering Gear Div., General Motors Corp., Saginaw, Mich. The cleaning units made by Wheelabrator Corp., Mishawaka, Ind. are spread over the plant as integral parts of automated transfer lines. It's a setup that speeds production and reduces handling problems.

A foreman once in charge of a department with metal washing machines predominating now finds himself in charge of a line or section that may include furnaces, cooling systems, washers, blast cleaners, and grinding equipment.

Inspection of blast cleaners becomes a different problem too. Maintenance personnel must range over the entire shop to inspect each unit. It places a premium on trouble-free operation and infrequent replacement.

Fits in Bearing Line — Bearings start as bar stock machined on automatics. After passing through a metal washer for degreasing, the machined bearings slide onto a belt conveyor which transfers the parts to a 15-in. continuous cleaner. The unit removes burrs and provides a surface for copper plating.

Because much of the time the bearings are not flowing from the automatic, Saginaw installed a flapper valve in the chute leading from the washer. As long as bearings strike the flapper, the valve energizes a timer. When no bearings are being processed, the timer turns off the blast cleaner after a 4-minute period.

Since installing the valve, the plant finds that 70 hours of cleaning process the same volume that used to take 210 hours. There's a significant savings in power, wear on equipment, and consumption of abrasive.

In the coupling line raw forgings pass through a one-wheel 26-in. cleaner for removal of forging scale. After heat treating and drawing steps, a second blast unit finishes the parts.

Clean Parts on Monorail—A two-wheel monorail blast cabinet is near the end of a line where raw forgings

STRAIGHT-THROUGH MILL: Continuous cleaner blasts machined bearings to obtain matte surface.

CLEANS FORGING SCALE: Raw forgings pass through 26-in. cleaner for removal of forging scale.

emerge as external spline slip yokes. The forgings go through hardening, drawing, blasting (26-in. cleaner), machining, and induction hardening. Then a monorail carries the pieces through washing and a draw furnace to stress relieve.

Approximately 50 fixtures, each holding 4 parts, pass through the furnace. The cycle time is about 90 minutes.

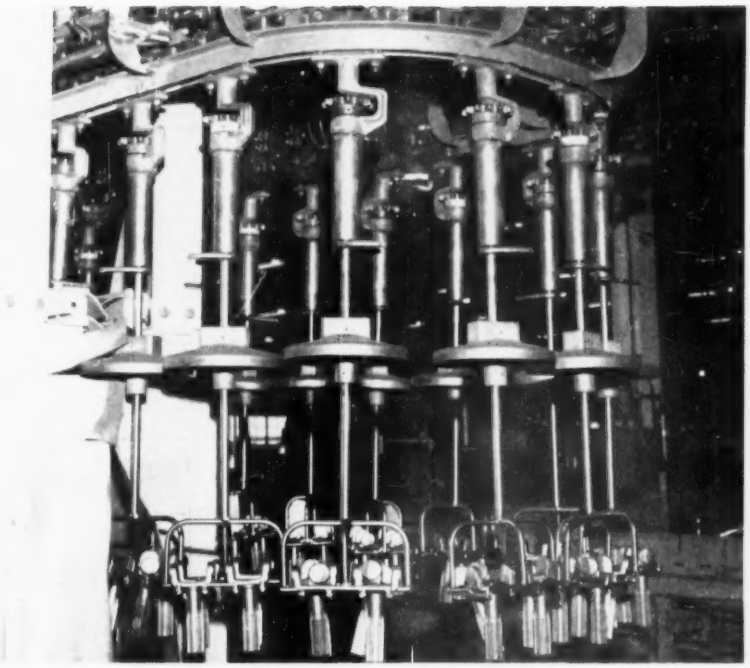
From the draw furnace, the parts pass cooling fans and enter the monorail cabinet. Blast cleaning removes any scale that may have formed in the draw furnace, thus insuring better surface for application of Lubrite.

A blow-off device with compressed air at the exit end of the cabinet prevents carry-out of shot. Although amount of shot per part would be small, 200 such parts every 90 minutes would carry out a significant amount over a year's time.

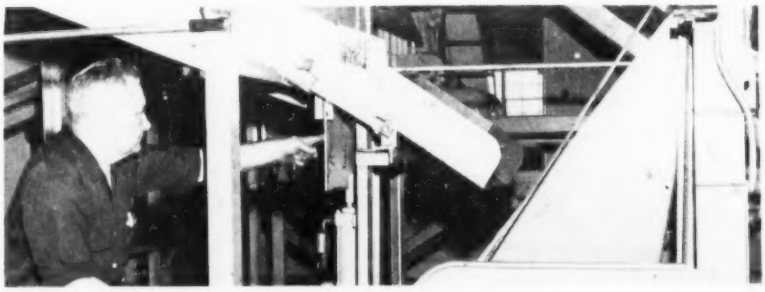
Load Cell Control—In the line processing spiders a 27 by 36-in. cleaner follows the draw furnace. Parts leaving the draw furnace drop in a large hopper. From the hopper parts slide down a chute to an automatic loader. Load cells on the cables of the automatic loader activate the charging cycle.

If the machine is empty and standing open, the loader starts when the proper weight has been deposited from the hopper. From then on, the cycle through unloading is automatic. Finished parts fall onto a belt conveyor that carries them to grinding stations.

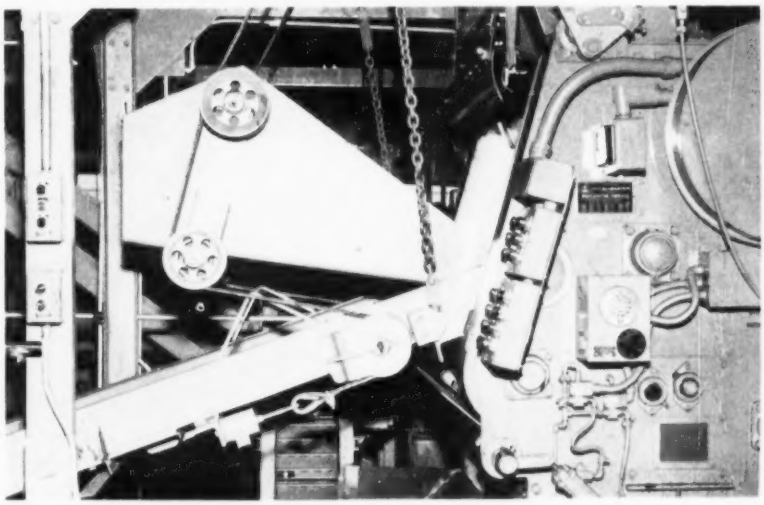
A similar unit at another Saginaw plant uses an electric timer. When the flow of parts is steady and sufficient, the timer is adequate. But any hold up in the line causes operation with only a partial load. The load cell unit keeps costs at a minimum by starting the cycle only with a full load.



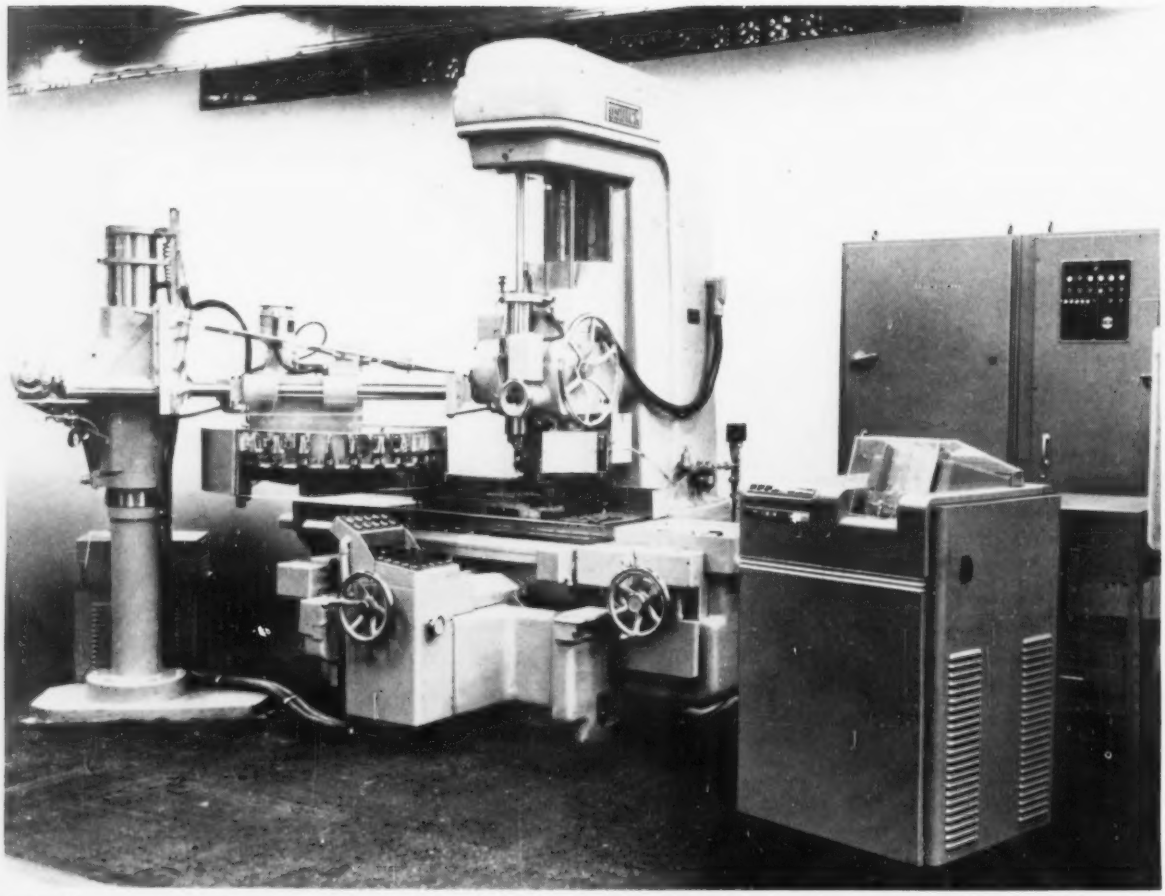
MONORAIL CABINET: Teeth at top of fixtures engage moving chain to rotate parts in blast pattern.



CONTROLLED LOADING: When loader has received specified weight of parts, load cells actuate hydraulic system to close gate.



CHARGING A FULL LOAD: Load cell (cylinder at end of cable) is one of two that weighs parts for full load.



COMBINED UNIT: Punch cards control steps for table location, spindle motions, and automatic tool changing.

Punch Cards Control Jig Borer

Quality production in jig boring depends on many factors. Not the least is the skill and patience involved.

But the combination of punch cards and precision controls eases the human factors aside to keep quality at high level.

▪ Conventional precision boring requires continual attention of a skilled operator. Setups can be time-consuming and complex. Accuracy and scrap rate often depend on the judgment and skill of the operator.

A new automatic jig borer, on the other hand, performs all operations on a given part without attention of an operator. It's a development of Manufacturing Research Dept., International Business Machines Corp., Endicott, N. Y. For the basic unit IBM chose a "Fosmatic" jig borer made by the Fosdick Machine Tool Co., Cincinnati. It's suitable for operation from electrical signals.

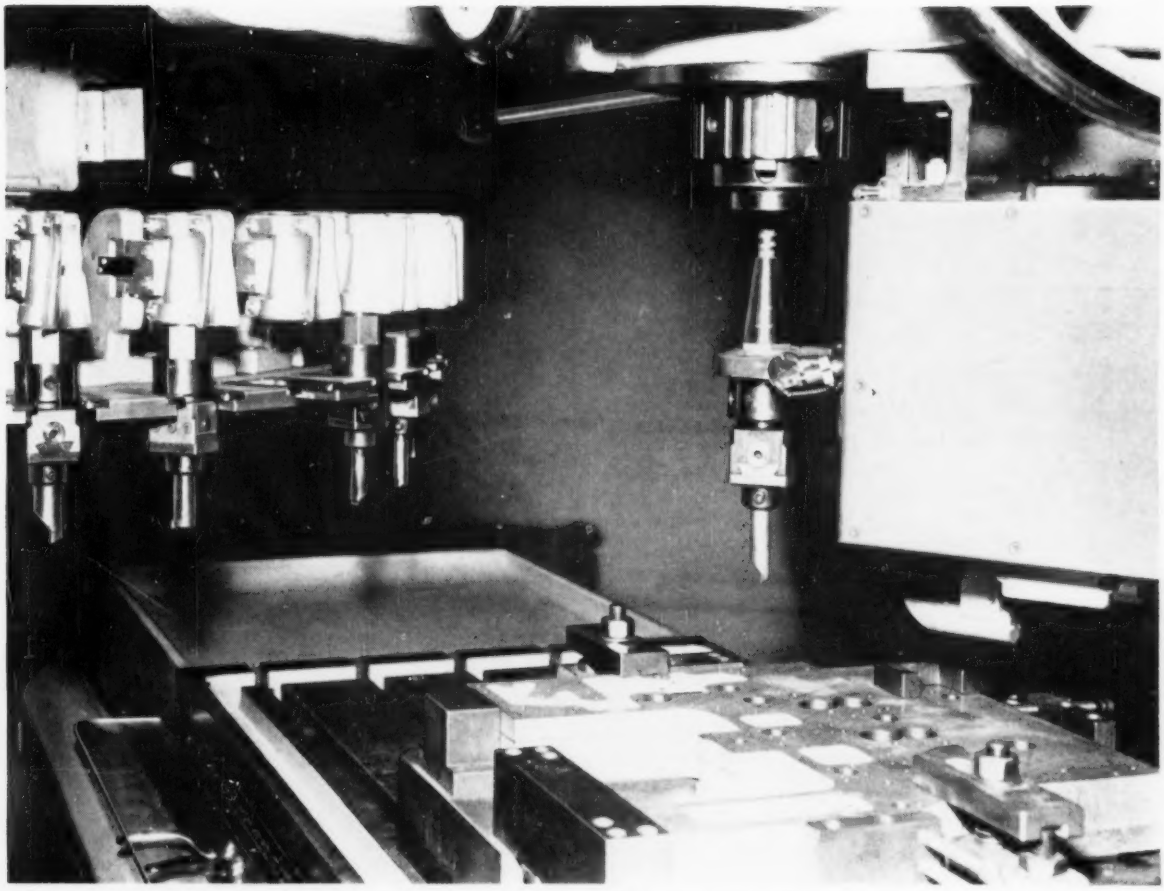
Through numerical control, IBM cards program the machine functions: choice of 30 or more tools, hole positioning, spindle speeds and feeds, hole depth, and spindle head height.

Each card specifies data for one hole. Thus a "deck" of cards programs each part.

Pays for Itself—The combined unit virtually eliminates set-up time, reduces machine cycles, and saves on overall manufacturing costs. It's the engineering department that normally plans the programs.

IBM uses its numerically controlled jig borer for side frames of data processing equipment. The unit performs 30 operations on each part. Total hole location error in the 16 by 18-in. side frame has never exceeded 0.0004 in.

Stress Remote Control—Electro-magnetic clutches control 16



EASY SELECTION: Tool changer selects programmed tool from rack and inserts it into spindle.

spindle speeds from 30 to 1800 rpm and 8 feed rates from 0.0005 to 0.0100 ipr. Clutch selection is made through relay contacts.

End-measuring gages measure table position along X and Y coordinates. There are four gages in even tens of inches, ten in inches, ten in tenths of inches and so on down to 0.0001-in. increments.

Motor-driven drum dials select the gages and position them end to end to provide the required measurements. The IBM setup translates punch card data into table position.

Movement of the table stacks the gages against a limit switch. The switch stops movement and a slight reversal relieves the lead screw. The table is clamped with accuracy of ± 0.0001 in.

Two special mechanisms are added to the basic machine. One selects a boring tool, inserts it and then removes it. The other controls hole depth.

Tool Selection — The selection mechanism, faster than manual operation, coordinates with other machine functions, such as table positioning. Tool storage is in a unit mounted separately from the machine. A disk carries 30 tools, indexed to pre-selected positions.

The unit slides on horizontal tie rods and turns to position a tool under the spindle. An air-operated wrench closes on the tool holder. After the disk retracts, the spindle rotates and engages the thread at end of tool holder shank.

At a pre-set locking torque, the wrench opens and the spindle feeds down in accordance with the program. The same steps in reverse sequence remove the tool.

A photoelectric unit controls rapid traverse of spindle close to work. As the tool feeds down, it passes through a light beam to shift into cutting feed rate.

Hole Depth Control—IBM takes advantage of the fact that a workpiece is subject to two general levels of vibration. The first results from the machine itself. The second occurs when the cutting tool enters the work. A piezoelectric crystal mounted on the workholding fixture detects this second vibration.

At tool entrance the crystal energizes a shaft digitizer geared to the downfeed spindle drive to measure each 0.001-in. downfeed.

Numerical control of spindle head insures the correct height, even with hole surfaces at extreme difference.

Powder Metal Press Gets Uniform Density in Odd Shapes

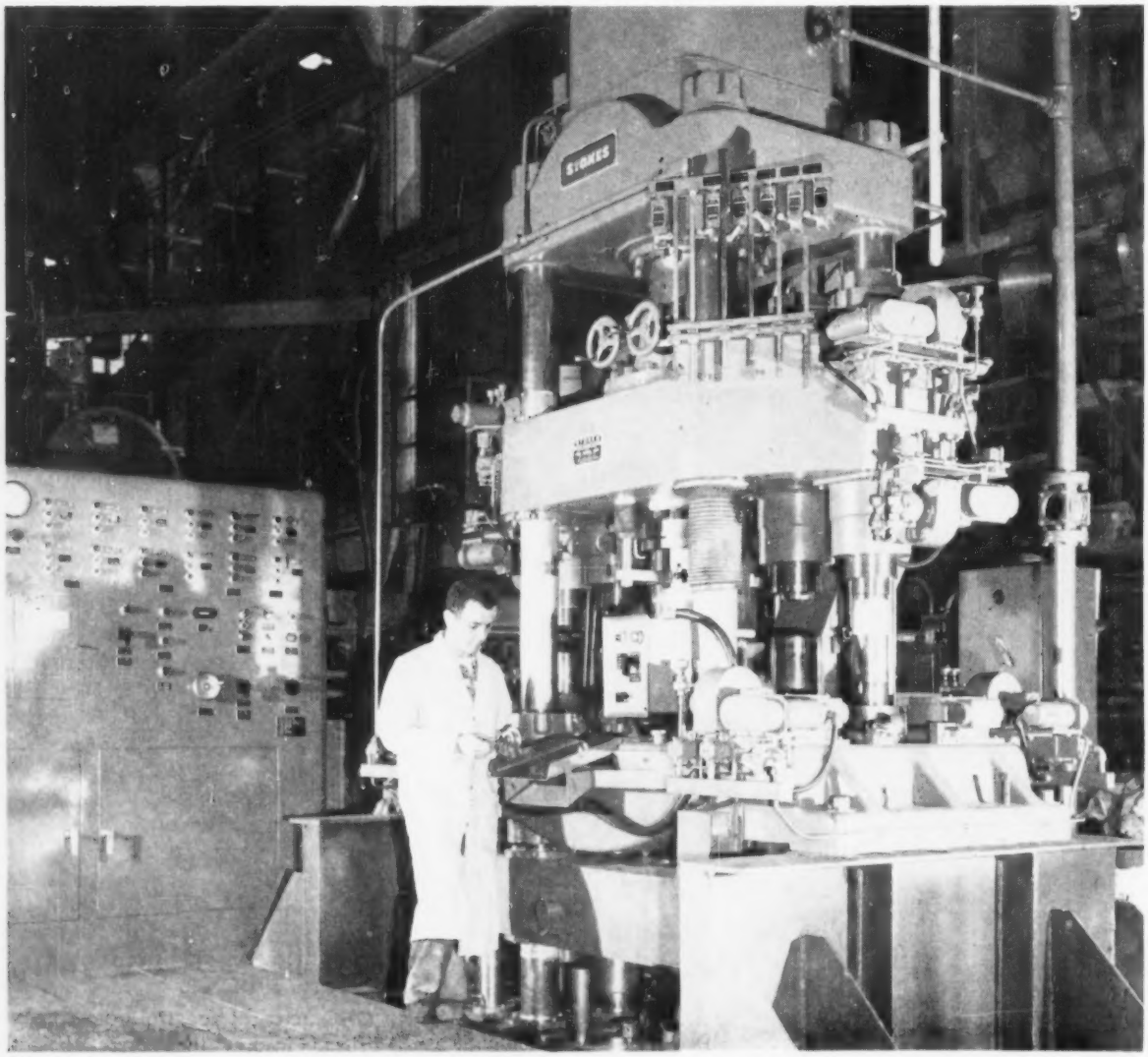
Composition and size of powder metal parts depend on the capabilities of the press.

Areas of improvement lie not only in raising press capacity, but in refining control of pressure steps.

▪ A new line of hydraulic powder metal presses features three production factors: High degree of uniform density, dimensional accuracy, and ease of setting up controls.

There are five models in the new series, ranging from 50 to 500-ton pressing capacity, capable of making parts from 6 to 14 in diam. The maker, F. J. Stokes Corp., of Philadelphia, recently demonstrated the first of the new presses.

It's a 300-ton unit built for Yale & Towne's Powdered Metal Parts Div., Franklin Park, Ill. The press has the capacity to form parts up to



VERSATILE PRESSING: With 300-ton capacity, new press turns out parts up to 10-in. diam. Proportional pressing insures uniform density on parts of differing diameters.

10 in. diam., weighing as much as 8 lb.

Proportional Pressing—The two lower compacting punches start their compression strokes at different levels and at different rates. But they arrive simultaneously at full-compression level.

It's made possible by two potentiometer-controlled hydraulic servo mechanisms that control the movement of the platens carrying the punches over a set relative-motion pattern. The shape of the part, the nature of metal powder, and specified density all determine the pattern.

Pushbutton Control—For fill and compression adjustment, air motor drives, operating from threaded stop rods, position each of the mechanical stops limiting the travel of the platens. A series of five-digit counters on the control panel indicates the actual location of each stop with respect to the reference point (upper surface of the die table). Each counter is alongside the pushbutton control for the air motor that drives that particular stop.

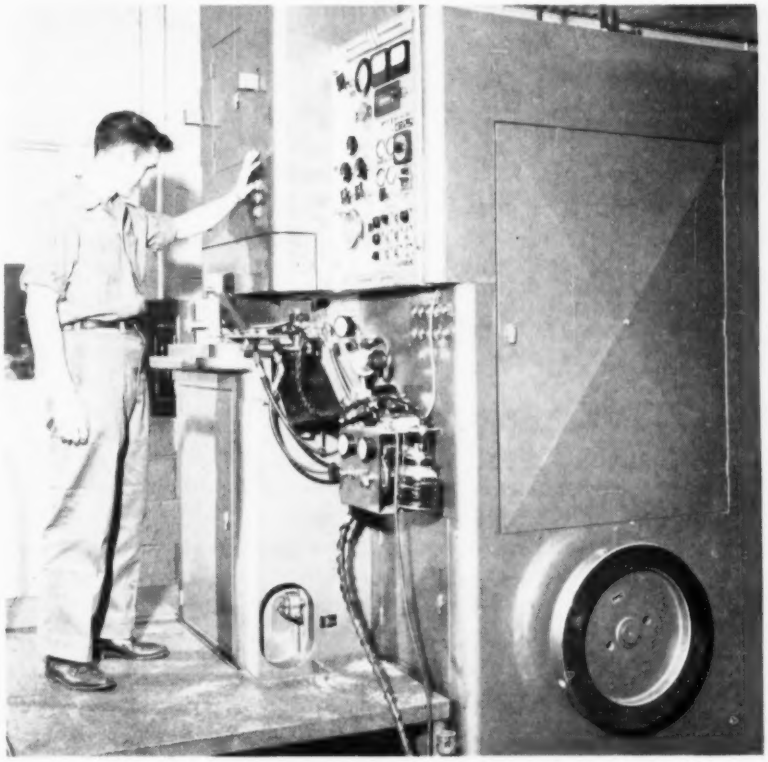
Two-speed control for each motor provides fast speed for large changes of position and slow speed for "jogging" the stop the last few ten-thousandths of an inch.

Settings Repeat—By recording the settings for these stops, the operator can reproduce the same setup when a specific part is again placed in production. He merely duplicates the previous dial settings.

Simultaneous ejection permits removal of thin flange parts without fracture of the "green" compact. This is done by moving the two lower punches together until the leading punch rises level with the face of the die.

The hydraulic power unit is self-contained, permitting press and power unit to be installed for most efficient use of floor space. A 150-hp double-end electric motor drives two independent 44.5 gpm hydraulic pumps. Filters and heat exchangers insure continuous flow of clean oil at the proper viscosity for uniform performance.

CONTROL PANEL: Motor-driven controls position mechanical stops to the nearest ten-thousandths inch shown on 5-digit counters.



SPECIAL FEED: Experimental feeding device is tested out on 50-ton press at new research and development laboratory of F. J. Stokes Corp.

WIDE CHOICE: Today's welding engineer can choose from a variety of different processes for arc-welding the stainless steels.

Tips on Welding Stainless

By **H. F. Reid, Jr.**, Manager, Technical Service Div., The McKay Co., Pittsburgh

Today's choice of processes, electrodes and techniques can add up to a mighty confusing picture, made more so by the variety of stainless materials now available.

▪ Development of specialized stainless steels has been accompanied by equally marked advances in welding techniques and processes. Today a welding engineer can choose from among a number of manual, semi-automatic or automatic procedures.

While details of the processes vary widely, they have one thing in common: In every case, final success of the welding operation depends greatly on conforming to basic metallurgical principles governing a specific alloy.

Despite the variation in properties, metallurgists divide stainless steels into three main branches: martensitic, ferritic, and austenitic.

Air hardening is the main trait of martensitic stainless steels. Rapid cooling produces high strength, brittle, notch-sensitive material. It's important, then, to use welding procedures that will insure control of mechanical properties. Preheating and postheating are usually required for welds on martensitic plate with welding electrodes of the same composition.

Unfortunately, much of the field work on Type 502, Type 410 or related materials doesn't permit such complete welding procedures. Bare, satisfactory joints are often made with Type 310 weld metal and restricted cooling.

Builds Internal Stress — Technically this practice seems unwise; the wide difference in thermal expansion of the two materials increases the stress locked up in the joint. Despite this, welded assemblies combining martensitic stainless and Type 310 chromium-nickel weld metal have proved satisfactory in many field jobs.

Successful welding of conventional martensitic stainless alloys with coated electrodes or welding wires of matching chemistry demands controlled preheat and postheat. Minimum preheat of 400° F is preferred; higher preheat is often used.

As welding progresses, preheating temperature becomes the interpass temperature. At conclusion of welding, the weldment should

Classification of Stainless Steels

Major Classification	Comparison Range for Welding, pct		
	Carbon	Chromium	Nickel
Martensitic	0.05-0.50	4-18	Residual
Ferritic	0.35 Max.	16-30	Residual
Austenitic	0.03-0.25	14-30	6-36

REACT DIFFERENTLY: Martensitic stainless steels weld easily but require annealing or tempering after welding. While the ferritic group can be welded, the welds tend to be brittle. Austenitic stainless also welds easily; it's the largest class and most widely used.

go directly to post-welding heat-treat without cooling to room temperature. Generally speaking, martensitic stainless weldments can be stress relieved, annealed, hardened, and tempered.

Actual welding procedures should be designed to minimize difficulties imposed by inherent hardenability and poor notch-toughness of the base metal. Welding currents are kept to the minimum consistent with good base metal fusion. Stringer beads are another method of reducing heat input and the problem associated with localized overheating. Welded joints should be designed to minimize concentration of stress and stress risers.

For Low-Carbon Alloys—Low-carbon martensitic stainless alloys are basically silicon-killed steels. They reportedly permit preheating temperatures to be cut 100° to 200°F, and in some cases reduce the need for immediate postheating. Successful welding depends on maximum rather than minimum heat input. Welding current should be near the maximum permitted by the electrode. A weaving technique is recommended to further increase heat input and retard solidification of the weld puddle.

Joint design is an equally important factor in the success of welds with these low-carbon materials. In the absence of a root opening, included angle of the bevel should not be less than 90°. Wherever possible provide large enough root openings for manipulating the molten slag and to insure adequate penetration.

Ferritic stainless steels are perhaps the smallest segment of the market both in number of alloys available and in fields of application. Their resistance to oxidation, scale and corrosion increase with chromium content. At the same time, general properties and weldability tend to become poorer. Type 446, with about 28 pct Cr, is the accepted composition ceiling for ferritic stainless steel joining materials.

The popular Type FeCr2-A1 high-chromium iron surfacing alloy is related closely to Type 446. The surfacing alloy contains fair amounts of carbon and molybdenum in addition to 28 pct Cr.

Preheat Works Two Ways — Ferritic stainless steels do not air-harden. Annealed ferritic stainless is tough and ductile. In the as-rolled or as-cast condition, steels of this type are somewhat brittle and crack sensitive. Preheating in the range of 250° to 400°F prior to welding greatly improves impact resistance of the base material and decreases the danger of cracking in either weld metal or plate.

But preheating also retards cooling rate. Under extreme welding conditions cooling can be slowed enough to develop sigma phase or other embrittling phases. Under normal welding conditions, however, cooling through the critical temperature zones is too fast to develop such phases.

Heat-treating of ferritic stainless assemblies is limited to stress relief or anneal. All post-welding heat-treat must be carried out at temperatures below 1600°F. Above 1600°F grain growth is very fast, resulting in lower strength and impact or crack resistance. Properties of coarse-grained material can't be improved by subsequent heat treatments.

Biggest Group—Austenitic stainless steels are the largest and most generally used group of stainless materials. Originally the 300 series consisted of a wide range of materials with various amounts of chromium and nickel as the main alloying agent. Today, small amounts of columbium, titanium, molybdenum, tungsten, copper, or combinations of these elements are added to produce stainless steels with specialized properties.

The newest group of recognized austenitic alloys is the 200 series. These alloys contain manganese substituted for part of the nickel in the conventional chromium-nickel alloy. Substitution is made on the basis of about 2 pct Mn for each 1 pct Ni replaced. Thus, conven-

Carbide precipitation: still a problem, but there are ways to deal with it.

tional 17-7 Type 301 becomes 17-4-6 Type 201 stainless steel. Type 201, 202, 204 and 204L reportedly have forming, joining, and corrosion characteristics about equal to those of their 300 series counterparts.

As yet unclassified but closely related to the 200 series are the low-nickel or nickel-free alloys. A high nitrogen, nickel-free austenitic stainless steel is also available.

Easy to Work With—Austenitic stainless steels generally are easier to fabricate and weld than either martensitic or ferritic types. Preheating and postheating are not essential, but can be employed. Full solution annealing is used, in some cases, to redissolve precipitated carbides. Austenitic stainless steels do not respond to hardening heat treatments.

Decreased corrosion resistance resulting from carbide precipitation is one of the problems encountered in welding materials of this type. It is most pronounced in lower alloy grades such as Type 204, 304 and 308. The problem becomes less critical as total alloy content is increased to the 25-12 or 25-20 levels.

Carbide precipitation occurs most rapidly when steels of this type are heated in the range of 1000° to 1200°F. Its extent depends on exposure temperature, length of exposure, and composition of the steel. Such zones of lowered corrosion resistance may occur in the heat affected zone of the plate material or in the weld area itself, depending on specific time-temperature conditions.

How to Prevent It — In many applications, carbide precipitation goes unnoticed. In others, it's a very pressing problem.

Here are four ways to minimize or overcome it: Use stabilized plate material and filler metal; use extra-low-carbon plate and filler metal; use unstabilized plate and filler metal, minimize heat input and follow welding with an immediate water quench; or use unstabilized plate and filler metal and follow fabrication with a high-temperature solution anneal and water quench.

Type 347 and Type 321 steels are 18-8 alloys stabilized with columbium and titanium, respectively. These additives combine with carbon to form stable carbides that eliminate the danger of carbide precipitation. Type 347 plate and filler metals may be used with virtually any welding process. The use of Type 321 filler metals is limited to welds made under protective atmosphere with one of the inert-gas processes. Both Type 347 and 321 plate materials may be welded successfully, from the corrosion standpoint, with Type 308 ELC materials. Such a combination is not recommended for applications where the high-temperature strength of Type 347 is important.

Welding of stabilized plate with unstabilized filler metal or unstabilized plate with stabilized filler metal generally is not recommended. If service conditions require the greater corrosion resistance of Type 347 or Type 321, then both plate and weld areas should be the stabilized alloy.

Another Way — A second approach to the problem is to use plate materials and filler metal that don't have enough carbon to promote carbide precipitation. Type 308, for example, can contain 0.08 pct C; maximum carbon content permitted in Type 308L is 0.03 pct.

A rapid water quench after welding is sometimes used in an effort to reduce precipitation. But rapid quenching often introduces severe distortion, safety and quality control problems.

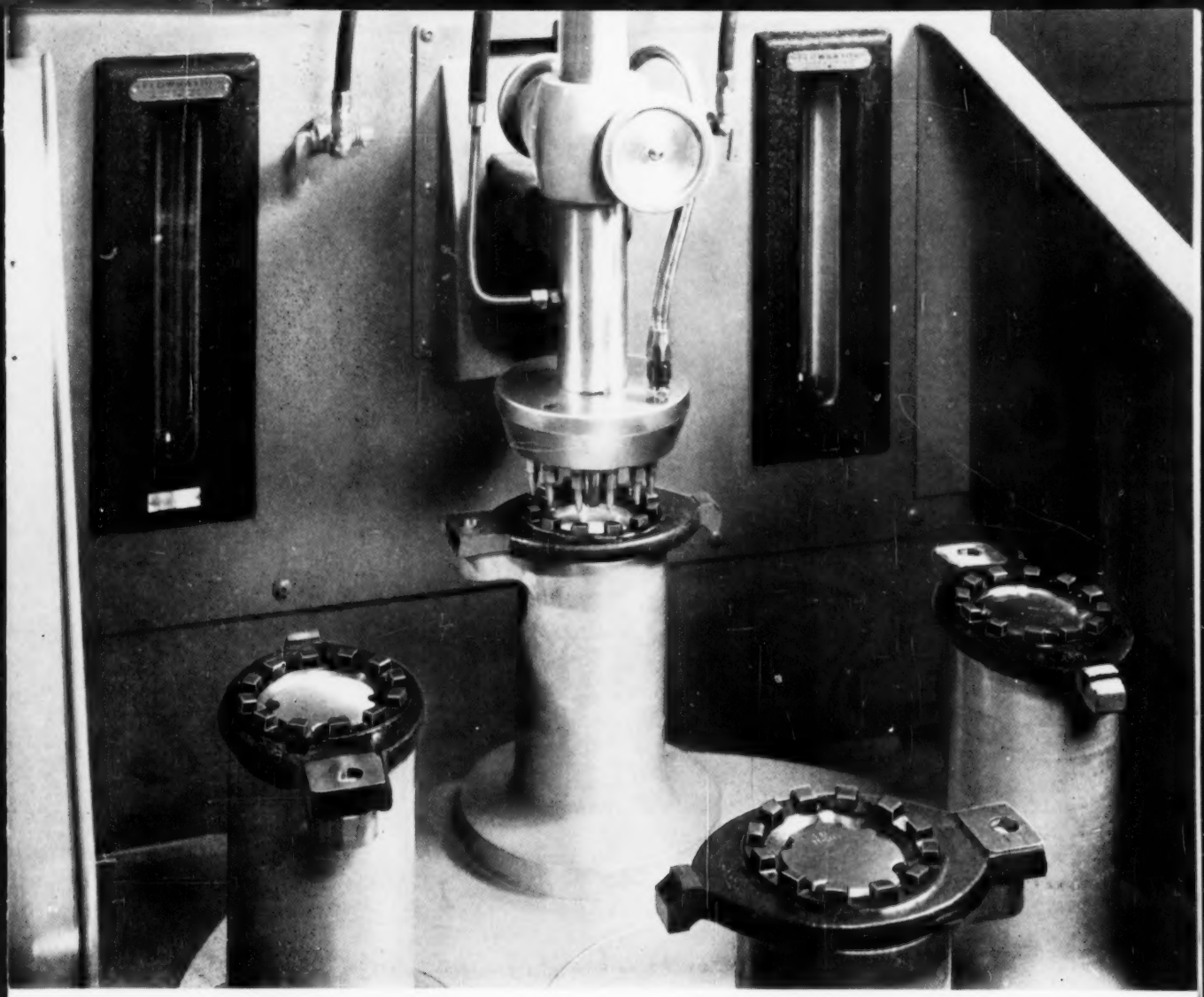
The fourth solution to carbide precipitation problems also involves unstabilized plate and filler metal. Fabrication is followed first by a high-temperature anneal to redissolve any segregated phases, then by a water quench. This approach is limited to weldments that lend themselves to subsequent heat treatment.

Welding Dissimilar Metals — Many applications require welding one grade of austenitic stainless steel to another, austenitic stainless to stainless steel of another type, or austenitic stainless to carbon steel. Each combination poses a new problem.

Unfortunately, there is no single electrode for all combinations. Today's rule-of-thumb for stainless-to-stainless is to choose a filler metal with an alloy content greater than that of either base material. Empirical charts such as the Schaeffler or DeLong constitution diagrams are helpful in selecting just the right alloy for maximum crack resistance.

Type 309 weld metal has proved superior to Types 308 or 310 fillers for joining 18-8 stainless to mild steel. Weld metal resulting from dilution of Type 309 filler metal by carbon steel plate is more ductile and crack resistant than if Type 308 filler metal were used. Type 310 filler metal is also used for welding stainless to carbon steel, but material cost is higher than with Type 309 filler metal.

Armor-welding electrodes offer perhaps the most crack-resistant and economical way to weld stainless to mild steel. Modified 18-8 armor-welding electrodes were developed during World War II as a replacement for Type 310 weld metal in high-stress applications. Peacetime use of armor-welding electrodes has been somewhat limited, possibly due to lack of familiarity with the special characteristics of the materials.



Now...*controlled hardening* of wearing surfaces

With these new Gleason machines you can make metal surfaces on couplings, splines, and other parts more wear-resistant by surface hardening.

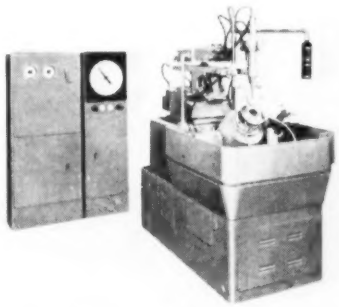
In the setup shown, the machine heats all twelve teeth of a coupling at once with a twelve-tip oxyacetylene burner. Indexing of work to the burners is automatically controlled.

A cam-controlled burner motion provides an oscillating movement of the burner tips to assure uniform penetration of the heating. This oscillating action in conjunction with electric timers controls the depth of hardness.

There is no measurable distortion because only the coupling teeth are heated and each tooth is heated uniformly on both sides, and the hardness is limited to the wearing surfaces. The life of the part is greatly increased.

You can set up the machine for small as well as volume production of parts up to 12″ diameter. Both ways, the machine is completely automatic except for loading.

This is one of a series of Gleason machines for hardening metal parts including bevel and hypoid gears and spur and helical gears. For additional information write for our bulletin. *Complete coupling is surface-hardened* in a single pass on the Gleason No. 108 Surface Hardening Machine.



Gleason No. 1 Gear Surface Hardener with electronic control unit. Accommodates bevel gears up to 24″ pitch diameter, spur and helical gears up to 30″, internal gears up to 24″ outside diameter.

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FREE TECHNICAL LITERATURE

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 65.

Clutch Conversion

Air friction clutches and brakes for reconditioning and modernizing existing mechanical presses are dealt with in a 16-page folder. Reasons why production is increased and maintenance is reduced as a result of clutch conversion are shown. (Minster Machine Co.)

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Precision Timers

Precision interval timers in a new series are described in a bulletin. These hermetically sealed units use the basic construction of a repeat cycle timer, but with a novel switching system which allows high accuracy over long range timing intervals. (The A. W. Haydon Co.)

For free copy circle No. 2 on postcard, p. 65

Carbide

The manufacture and physical properties of tungsten carbide are discussed in a technical manual. Its 20 pages include data on grade selection, application, use of single point tools, and recommended cutting speeds. (Firth-Sterling, Inc.)

For free copy circle No. 3 on postcard, p. 65

Dust Collector

Completely redesigned, a new oil bath aftercleaner is introduced in a bulletin. Built especially for collecting dust particles that might escape conventional dry centrifugals or viscous impingement filters, the unit's high collection efficiency might make it ideal for such difficult metalworking dust problems as cast iron machining, production metallic grinding, and tool room equipment grinding — operations that can easily cause oxidation damage. (American Air Filter Co., Inc.)

For free copy circle No. 4 on postcard, p. 65

Die-casting Process

A 4-page folder describes the Intercast die-casting process. This exclusive process permits automatic production of small hinged or linked parts in die-casting, without subsequent assembly. (Gries Reproducer Corp.)

For free copy circle No. 5 on postcard, p. 65

How To Pick Taps

"What Do You Mean 'Specific' Taps?" is a 20-page booklet. It tells how to get longer tap life and better performance. Using "specific" taps, it points out, gives better results in specific materials. (Detroit Tap & Tool Co.)

For free copy circle No. 6 on postcard, p. 65

Water Softener

Features of one maker's zeolite water softeners are described in a bulletin. It explains that the company's standard units easily adapt to individual plant requirements. This is especially true where applications involve eliminating maintenance due to scaling of boilers, pipes and heat exchange tubes, the production of chemically suitable water for various process uses, and the correction of other special water problems. (Allis-Chalmers Mfg. Co.)

For free copy circle No. 7 on postcard, p. 65

Tools, Attachments

Precision tools for automatic screw machines and turret lathes are listed in a firm's 32-page catalog. (R. & L. Tools).

For free copy circle No. 8 on postcard, p. 65

Vibrating Equipment

Vibrating equipment for metalworking shops, highway construction jobs, etc. is featured in a 6-page folder. It covers vibrating screens, feeders and conveyors made in the U. S. under license from the Carl Schenck Company of Germany. (Dravo Corp.)

For free copy circle No. 9 on postcard, p. 65

Hose Fitting

Teflon aircraft hose assemblies with reusable fittings are described in a catalog supplement. (Titeflex, Inc.)

For free copy circle No. 10 on postcard, p. 65

Grinders

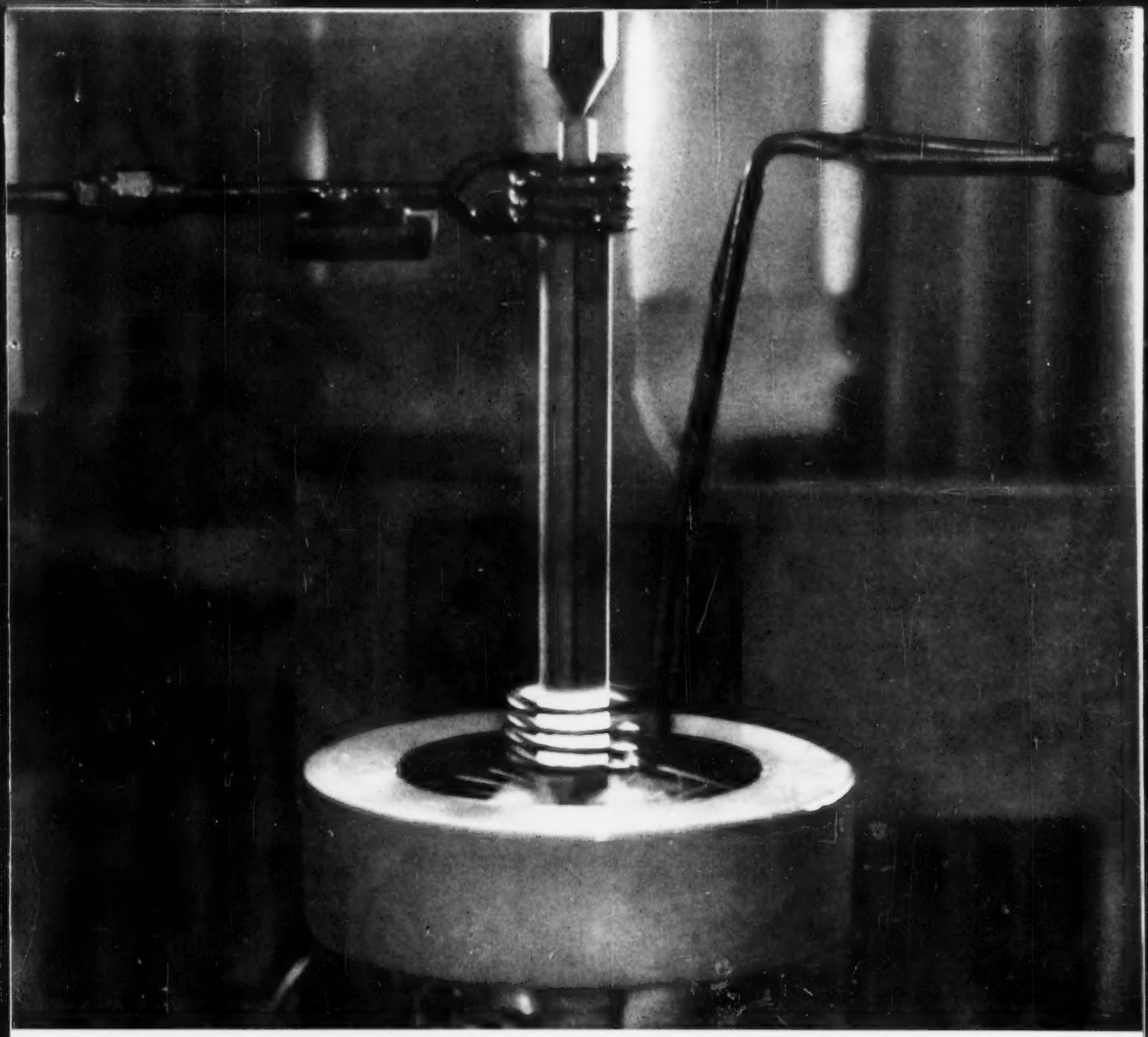
Hydraulic knife and face grinders are featured in a brochure. It tells how these units offer precision and performance on production work. Grinders have automatic wheel feed, abundant coolant, variable table speed, controls convenient to operator. (United Engineering & Foundry Co.)

For free copy circle No. 11 on postcard, p. 65

Lift Truck

A pair of 4-page brochures cover specifications and descriptions of a new idea in electric fork lift trucks. Models come in 12,000 to 20,000 rated lifting capacities. Elimination of uprights or mast and accompanying components on the trucks results in a weight reduction and overall length and width are less. (Automatic Transportation Co.)

For free copy circle No. 12 on postcard, p. 65



Ketos shaft being induction hardened to Rockwell 55-56, while ends remain soft for final machining. Photographed at Control Instrument Co., Inc., Brooklyn, N. Y.

KETOS has wide hardening range with minimum volume change...

Ketos is a low priced alloy tool steel that can be hardened from low temperatures with practically no volume change. It has deep hardening qualities, and a fine grained structure, that make it desirable for many production parts.

That's why nondeforming Ketos is well suited not only for most tool steel applications such as gauges, dies, and taps but also for close-tolerance, wear-resistant parts like the actuator bar shown in the induction heating unit above. The thin contact edges of this particular part withstood a "life test" of over 4-million high speed blows. No other steel tested lasted more than 1-million cycles before it chipped and failed.

If Ketos sounds like the steel you should be using, call your nearby Crucible warehouse. Stocks of Ketos and dozens of other special tool steels are large, delivery fast. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

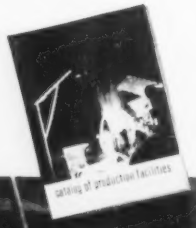
Crucible Steel Company of America

Canadian Distributor — Railway & Power Engineering Corp., Ltd.

Extruded Shape Formed and Flash Butt-Welded . . . the Low-Cost Way to Make this 268 lb. Stainless Steel Ring

By using extruded or mill-rolled shapes and flash butt-welding, American Welding can frequently help customers slash production costs of their circular products over other methods of manufacture. Savings in expensive metals are substantial, plus sizable reduction in machining time. And where some of the more difficult metals to weld — such as titanium, aluminum, zirconium, stainless and heat-resistant alloys — are required, American Welding has the special knowledge and equipment to do those difficult jobs to your specifications.

The use of flash butt-welded rings, bands, and assemblies has saved millions of dollars for jet engine manufacturers . . . why not investigate what economies it can mean to you. If it's circular and of metal — call American Welding first!



NEW PRODUCTS CATALOG AVAILABLE. Write today for 20-page catalog illustrating the many types of circular products American Welding can form, weld and machine for you.

AMERICAN WELDING

THE AMERICAN WELDING & MANUFACTURING CO.
120 DIETZ ROAD • WARREN, OHIO

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Bearing Problems?

If you have bearing problems, maybe this 4-page folder can help you. It describes products and services of a company that's been smoothing customers' bearing worries for nearly a half century. (Messinger Bearings, Inc.)

For free copy circle No. 13 on postcard

Protective Coating

Features of a super-tough plastic type protective coating are reviewed in a bulletin. It describes the product as a balanced chemo-setting synthetic resin coating. The material is formulated from special blend of silicones and epoxies; it contains no plasticizers or oils. (Mono-Seal Products).

For free copy circle No. 14 on postcard

Gages

Height and size measuring gages are featured in a 4-page bulletin. These highly accurate instruments are easy to use and they afford fast readings. (Pacific Gage, Inc.)

For free copy circle No. 15 on postcard

Barrel Finishing

Catalog sheets now available describe barrel finishing units. One of these machines is capable of doing many jobs of barrel finishing and deburring. The new multi-use barrel comes in sizes up to 120 in. ID. For large loads it may be used as (1) a single cavity barrel; (2) inserting a "compartment" type container into the main barrel provides six or more separate divisions each capable of holding a different job; (3) using a custom-designed holding fixture to which large work pieces are attached, it finishes parts up to 118-in. long. Any of these changes can be made with little effort in a matter of minutes. (Speed-D-Burr Corp.)

For free copy circle No. 16 on postcard

Cold-headed Fasteners

A condensed design handbook covers cold headed specialties (i.e., rivets, nails, screws, other fasteners and small parts). Data includes cost and design advantages and manufacturing possibilities plus information on metals and finishes. (John Hassall, Inc.)

For free copy circle No. 17 on postcard

Four-Slide Machine

Major operating features of a new all-purpose vertical four-slide machine are given in an 8-page technical bulletin. It gives design details for the feed mechanism, cam and cam shafts, drive system, and presses. (Torrington Mfg. Co.)

For free copy circle No. 18 on postcard

Lifter-Dumper

In eight pages a catalog offers data on one maker's skip hoist multi-purpose dumpers. Instructional photos show how the equipment handles bags, boxes, bulk, drums and free flowing material at rates to 75,000 lb per hour. (Essex Conveyors, Inc.)

For free copy circle No. 19 on postcard

Cold Friction Saw

A bulletin features a new cold friction saw. Designed and built for production friction cutting, it comes in four different sizes. The bulletin describes the saw as an economical tool for cutting beams, columns, angles, etc. (United Engineering & Foundry Co.)

For free copy circle No. 20 on postcard

Heat Treating

Ten design and construction features of new heat treating units are listed in a brochure. These include:

Postcard valid 8 weeks only. After that use own letterhead fully describing items wanted. **12/26/57**

Circle numbers for Free Technical Literature or Information on New Equipment:

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alloyed ceramic heating tubes; single-piece cast fan and shaft; cold-chain drive for moving work trays; automatic and semi-automatic mechanical loaders and unloaders; 100 pct forced convection heating, and a one-piece cast Meehanite front door. (Ipsen Industries, Inc.)

For free copy circle No. 21 on postcard

Tag Press

A new kind of low cost metal tag producing press appears in a company's literature. Actually the press is a combination of a standard foot-press with an embossing, punching, blanking and flattening assembly. An air cylinder arrangement provides power. It works from an ordinary air line of 75 psi or more. (The Acromark Co.)

For free copy circle No. 22 on postcard

Automated Positioner

Numerical-controlled 42-in. plain rotary positioning tables are described in a new circular. Data supplied by punched tape or keyboard is translated into highly accurate mechanical positioning with this unit, the literature says. It gives a comprehensive review of the equipment. (Pratt & Whitney Co.)

For free copy circle No. 23 on postcard

Steels

Included in a new catalog is a 2-page chart for carbon steels, low alloy-high tensile steels, die steels, corrosion resistant stainless steels and heat resistant stainless steels. Very clearly shown are grades, typical analysis, typical physical analysis, weldability, comparable specifications and remarks regarding the formulas. (Induction Steel Castings Co., Inc.)

For free copy circle No. 24 on postcard

Diversified Firm

All activities in which a large diversified corporation engages are reviewed in a 28-page brochure. It contains brief descriptions of equipment engineered and built by its pelletizing, steel mill, heat treat, glass, engineering, boiler burner, air conditioning and drying, and aircraft divisions. (Surface Combustion Corp.)

For free copy circle No. 25 on postcard

Multi-spindle Machine

Company descriptive matter tells about a special five station multi-spindle vertical machine. This unit performs numerous drilling, tapping, spot-facing, counterboring and chamfering operations on cast-iron automotive parts. (Ex-Cell-O Corp.)

For free copy circle No. 26 on postcard

Special Machine

Parts to 28-in. long can be drilled, centered, spotfaced, chamfered, reamed, tapped, threaded, hollow milled or bored on a versatile new machine. Designed to do opposed operations simultaneously, this unit may be used with a small index table, manual or air clamp fixtures, hopper or vibration feeds. A company's written matter describes it. (Hartford Special Machinery Co.)

For free copy circle No. 27 on postcard

Lighting Fixtures

Installation suggestions and operating characteristics for fluorescent lamp ballasts appear in a 16-page publication. It covers lamps, starters and ballasts. (General Electric Co.)

For free copy circle No. 28 on postcard

Brass Plating

Literature now available discusses merits of a new bright brass process. This direct plates wire goods and hardware. It boasts good leveling and current densities to 300 amp per sq ft. (Yorktowne Special Products).

For free copy circle No. 29 on postcard

Spectroanalysis

Advanced equipment for spectrographic laboratories is reviewed in a bulletin. It describes units and accessories for spectrographic analysis. (Applied Research Laboratories.)

For free copy circle No. 30 on postcard

Unit Burns Scrap Autos At Production Rates

When scrap men burn auto bodies without creating smoke, community air pollution men are happy. But units to do this cost money. Clean air won't pay for the equipment.

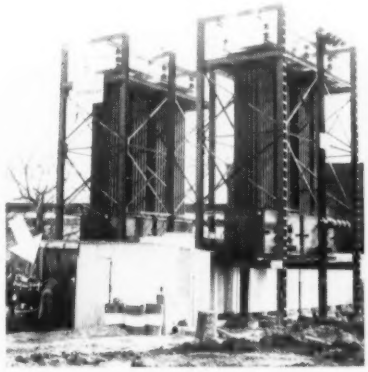
A new burner not only eliminates smoke, but burns more cars, faster, better. Makes scrap men happy too.

▪ Making possible burning scrap car bodies at very high speeds (100 cars in an 8-hour day) is a new Smokatron unit produced by Summer & Co., Columbus. Recently unveiled at the J. T. Knight & Son yard in Atlanta, the unit has been boomed by scrap dealers and air pollution experts alike. The former, because it can mean more profits; the latter because it helps bring a practical answer to a problem that has long harassed many communities.

Solves a Problem—Faced with ever-tightening air pollution controls by local governments, scrap men are being asked—or forced—to burn bodies in units that make practically no smoke. Most big dealers agree with this, since such non-polluting operations can pay off in more efficient burnings and good community and public relations.

Cooperation with local authorities becomes increasingly attractive, though, when it also means more profits. That's exactly where the new Smokatron comes in. It burns old autos at rapid production rates and does it far better than the old open-fire way.

Nils Pollution—Public health and anti-pollution officials at the Atlantic showing found the Smokatron's performance "gratifying." One of these, a chief air pollution engineer of a big eastern city, has this to say: "This is a most significant advance in control equipment. It will be a major contribution to the elimination of air pollution from scrap yard operations. Furthermore, it eliminates forever the contention that nothing can be done about scrap yard burning."



This setup burns auto bodies at a 100-per-day clip.

Steel mill officials who inspected the burned car bodies were particularly interested in the good cleaning job resulting.

Manufacturer Produces Bellows of Inconel

To meet tough requirements of many new high-pressure and high-temperature jobs, a manufacturer has developed metal bellows of Inconel and Inconel-X. The nickel-chromium alloy bellows are now in use in various aircraft and nuclear engineering applications.

Aside from its high strength and resistance to corrosion at high temperatures, the Inconel-X bellows have excellent stability and "hysteresis," says Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn. These bellows, of age-hardening material, are particularly designed for aircraft controls and similar uses where precise response must be repeated many times over for an extended period.

Bellows Are Durable — Recent tests by the firm indicate the bellows are very durable. The company reports they outlasted bellows of another material three times over. A 4-ply Inconel bellows of 2-in. OD can withstand 100 psi pressure at room temperature. Inconel and Inconel-X can be used in high temperatures up to 1500°F.

Inconel bellows are being manufactured in a wide variety of sizes from 15/32 to 12-in. OD and in single to four plies.

Train Fluid Power Men

Lack of properly-trained, qualified personnel to install, operate, and maintain fluid power equipment hinders the industry's growth. So state Dr. R. C. Binder and H. L. Stewart, fluid power authorities who have teamed up with several organizations to prepare a program to train qualified personnel. More data is available through the education dept., Hitchcock Publishing Co., 222 E. Willow Ave., Wheaton, Ill.

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 65. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

Republic ELECTRUNITE

WHEN IT'S MOVING, MAKE IT TUBING . . . a Republic engineering principle that improves sales and profits for manufacturers. This simple 2½-inch bearing liner made of Republic ELECTRUNITE Stainless Steel Tubing is featured in the new "Highlander" Automatic Washer developed by the Maytag Company to meet the needs and requests of budget-conscious young Americans.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

Stainless Steel Tubing... helps MAYTAG bid for Big Volume Sales

Engineering innovations such as this switch to Republic ELECTRUNITE® Stainless Steel Tubing made it possible for the Maytag Company to produce its new "Highlander". This automatic washer is priced to meet the needs and demands of budget-conscious young Americans without sacrificing quality found in top-of-the-line models.

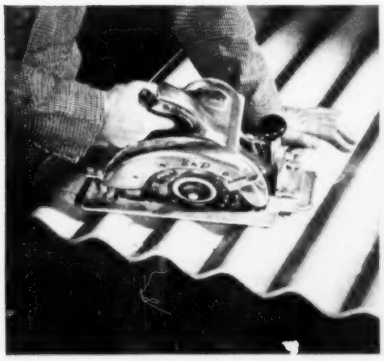
It's a simple 2½-inch bearing liner. But, it saves Maytag money.

Republic ELECTRUNITE Stainless Steel Tubing provides greater true concentricity than the tubing formerly used. There is no need for buying a heavier wall and then spending more money to remove stock.

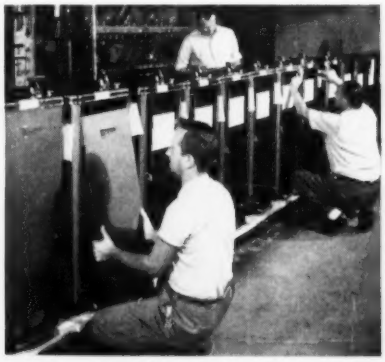
Tubing originally purchased was .187" wall thickness. By utilizing the concentricity of ELECTRUNITE they were able to reduce the wall to .083".

And, they get the rust-and-corrosion-resistance that only stainless steel can offer. This is vital because the tube becomes the outer shell of the main agitator bearing. It must operate for the *life of the washer* with no further lubrication than originally supplied.

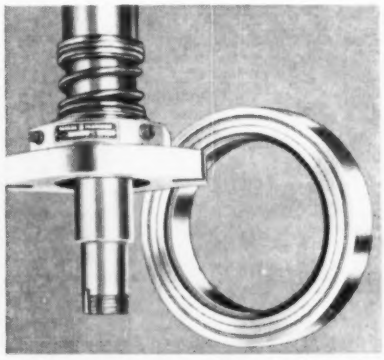
Welded stainless steel tubing can save you money and hold quality high. Especially when it's ELECTRUNITE—uniformly round, uniform in wall thickness, free from defects, resistant to rust and corrosion, easily fabricated, strong, tough. And, produced by Steel and Tubes—the pioneer in electrically welded tubing. Let us show you where it can cut costs, improve quality in your products, processes and plants. Write for additional information today.



HEAVY-DUTY PERFORMANCE and reliability have played a major part in establishing product reputation for The Black & Decker Manufacturing Company, Towson, Maryland. Strong, long-lasting gears made from Republic Cold Finished Alloy Steel meet the heavy duty service requirements in this Black & Decker portable electric saw. And exceptionally high strength-to-weight ratio permits design of thinner sections to save weight and hold down size without sacrifice of strength. These are but a few advantages Republic Cold Finished Alloy Steel may offer you in your operations. For complete details write today.



REPUBLIC ELECTRO PAINTLOK, used for these water cooler housings, or for exterior panels of ranges, freezers, dryers, washers, air-conditioners and other major appliances and cabinets for home, commercial and industrial applications, provide an excellent paint-gripping surface for greater finish economy. Produced by electro-galvanizing and a chemical treatment process, Electro Paintlok Sheets are shipped from the mill in prime condition for painting. Even if final finish is scratched through, this coating limits corrosion to the point of damage. For additional data and complete details, send coupon.



REPUBLIC ENDURO® STAINLESS STEEL BARS develop a machine finish that looks as good as a ground finish—is the performance report from machine operators at Sealol Corporation, Providence, Rhode Island. This company used Free-Machining ENDURO bars in the manufacture of mechanical shaft seals for applications on fuel tankers, and in the food, chemical, aircraft and petroleum industries. Sealol machine operators like the machinability of ENDURO Stainless Steel Bars—the fine surface finish, the accuracy of section, the uniform soundness, and the ability of ENDURO to hold close tolerances. Send coupon today.

STEEL

and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. C-4634
3104 EAST 45TH STREET • CLEVELAND 27, OHIO

Please send additional information for the following:

- ☐ Republic ELECTRUNITE Stainless Steel Tubing
- ☐ Republic Cold Finished Alloy Steel
- ☐ Republic Electro Paintlok
- ☐ Republic ENDURO Stainless Steel

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

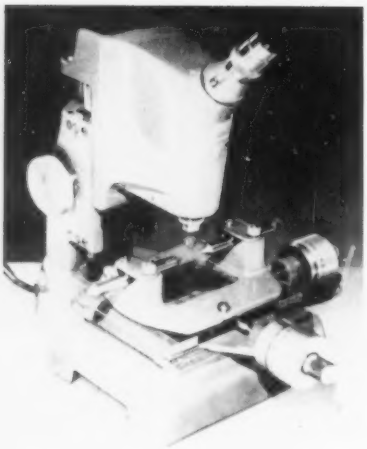
New Production Ideas

Equipment, Methods and Services

Curtain of Light Protects Press Operators

Making a machine safer can result in better worker morale and upped efficiency and output. With this thought in mind, a manufacturer has introduced this "curtain of light" press guard. Unlike some photoelectric relays, it doesn't leave dangerous gaps between individual narrow beams. Instead, this setup projects a broad beam of light (to 18-in. high) across the danger area of the press. If this light-curtain is broken at any place—even by the thickness of a man's wrist, the unit stops the press. When the worker's hand withdraws to a safe position, the press can be tripped automatically. Production can go up due to the extra time gained by the operator, who can be reaching for new stock instead of pressing push-buttons, as with other guards. And it's fail-safe. When the light-curtain fails, the press won't work; "cheating" the equipment is almost impossible. (Electronic Control Corp.)

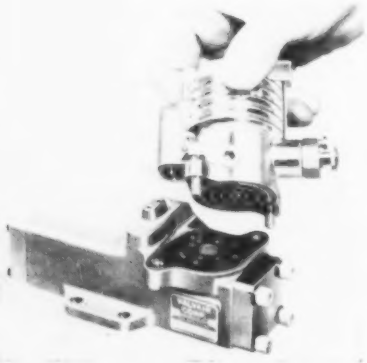
For more data circle No. 31 on postcard, p. 65



Microscope Is Speedy and Easy to Use

Inspection and measurement of drills, taps, jigs, templates, broaches, milling cutters, reamers and small workpieces can be made with ease and simplicity with this new toolmakers' microscope. Manufactured by Bausch & Lomb, the instrument combines optical and mechanical precision. It weighs 23 lb. The total range of magnification with interchangeable eyepieces and objective lenses is 27x to 360x. Standard lenses supplied give a magnification of 35x. The eyepiece is conveniently angled for comfortable use over extended periods. A knurled ring on the eyepiece permits sharp focusing on the cross lines. Simply adjusting a screw aligns these cross lines to a position exactly parallel with stage movement. Positive focusing is achieved by rack and pinion, totally enclosed within the microscope head. Working distance is 4 in., permitting focus on parts or tools up to 2½-in. deep. (The DoAll Co.)

For more data circle No. 32 on postcard, p. 65

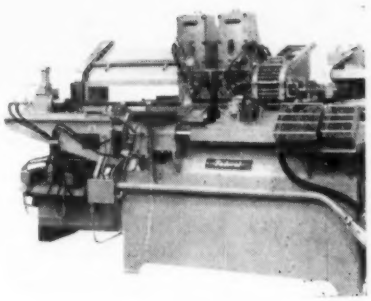


Control Valves Feature Built-in Connectors

Featuring built-in plug connectors for fast, automatic connection of electrical circuits is this ¼-in., 4-way control valve. It's designed to cut original installation and in-service maintenance time. Plugs and connectors in the solenoid pilot, valve body and manifold or sub-base complete all electrical circuits automatically when the unit is placed in the mounting position. Permanent wiring connections, made at the time of original machine assembly, need not be disturbed during in-service maintenance. The plug-in feature also permits economical bench assembly of complete control groups and cuts final machine assembly time, according to the manufacturer. (Valv-air Corp.)

For more data circle No. 33 on postcard, p. 65

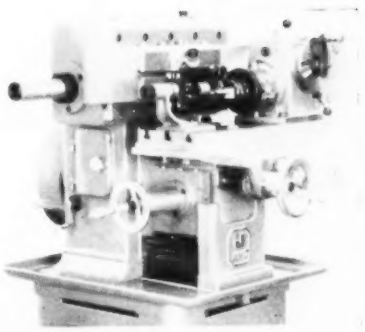
Machine Flash-welds Workpieces Automatically



This automated flash welder is designed to resistance flash weld worms to ends of automotive steering gear shafts. Both parts are automatically fed from loading chutes, injected against a gauge bar for correct weld position, and ejected after welding. A marking device for the shaft and a radial positioner for the worm are incorporated in the automatic sequence. The unit employs a safety feature which stops continuous machine operation if part loading chutes become empty. The welder incorporates a 150-kva transformer. (Federal Machine & Welder Co.)

For more data circle No. 34 on postcard, p. 65

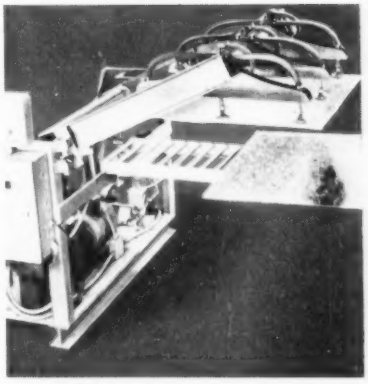
Punch Shaper Works High Precision Parts



This form and punch shaper makes irregular shaped stamping and electrode punches of high precision (±.00025 in.). It employs a large dividing head with automatic circular feed. This permits the machining of radii and angles automatically. In addition, punches need no further machining operations when completed on the machine. All workpieces are clamped directly in a collet holder, between centers or to the co-ordinate chuck. This co-ordinate chuck and indexing attachment guides the workpiece along the contour with one chucking. Thus it eliminates rechucking errors. (Jersey Mfg. Co.)

For more data circle No. 35 on postcard, p. 65

Sheet Feeder Handles Irregular Shaped Sheets



Designed to handle a wide variety of materials, including sheet metal, is this feeder. It moves sheets that are flat or formed, rectangular or irregularly shaped. Although the feeder primarily is for delivering sheets from piles to processing equipment (slitters, punch presses, forming machines, etc.), it also may remove sheets from conveyors or machine tables for stacking. Sheets may be picked up and/or delivered horizontally, vertically, or at any angular position. However, they are usually handled in the horizontal position, parallel to the floor. The machine will feed automatically upon receipt of signals from an associate machine, a timing device, a sheet sensing mechanism, or from the feeder itself upon discharging a sheet. Sheets up to 6 x 15 ft may be handled. (The de Florez Co., Inc.)

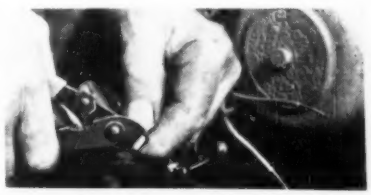
For more data circle No. 36 on postcard, p. 65

Control Lets Operator Pre-select Lathe Speed

With a new line of lathes, the operator can pre-select the speed for the next operation while the previous one is still working. The new machines come in ratings of 1610 (13 in.), 2013 (16 in.) and 2013-17 (20 in.). Engine, toolmaker, gap models and 45° and 90° tracer controlled types are available. Using such a lathe, the operator pre-selects his next speed while the tool is cutting. This reduces idle. Using the correct cut speed for each diameter reduces tool wear, tool changing and tool cost. Similarly, correct cut speed produces a good finish, reducing subsequent finishing operations. (The Lodge & Shipley Co.)

For more data circle No. 37 on postcard, p. 65

Tool Strips 24-gage Wire Without Nicking



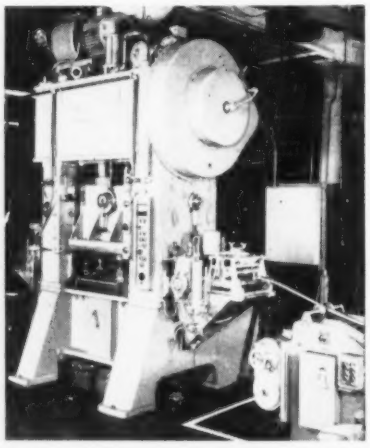
This newly designed wire stripper is only 5-in. long. Yet, it features a thumb-operated gage and strips all commonly used insulated wire from 14 to 24 gage without nicking or cutting. Even the larger sizes of wire can be handled with ease. Specially hardened edges cut easily. Probably the tool's major advantage is that all settings can be made

quickly. This is done by simply turning the star gage to the desired notch opening size, notch, and strip. The tool's plastic grips lessen fatigue and increase user comfort. (Proto Tool Co.)

For more data circle No. 38 on postcard, p. 65

Automatic Presses

New high production presses employ an automatic coil feed plus modern press-mounted controls and devices. These two-point straight side presses can perform a variety of blanking, forming, drawing and perforating operations in long or short runs. They are comparatively heavy and massive throughout to take the punishment of high speeds and continuous operation. Extra bearings give good support to the crankshaft, feed take-off and main gear. The press' rigid, reinforced box-type slide is fully contained in a square, extra-long gibbing during the working portion of the stroke. An automatic circulating oil system keeps every bearing surface lubricated at all times. Perfectly mated to the press, an automatic unit feeds coil stock at speeds up to 100 fpm. A special roll-lifting system built into the press offers independent, infinite adjustment of



ingoing-outgoing rolls from floor level. The electro-pneumatic friction clutch operates directly on the crankshaft. Built with shaft diameters from 4½ to 9 in., the units come in capacities from 60 to 200 tons (non-geared), and 75 to 300 tons (geared). (Niagara Machine & Tool Works.)

For more data circle No. 39 on postcard, p. 65

Band Saw

Incorporating a hard edge and flexible back, a new band saw blade has positive rake hook teeth. This design, says its maker, lets the blade cut with a smooth, clean shearing action that requires less feed pressure. (L. S. Starrett Co.)

For more data circle No. 40 on postcard, p. 65

Penetrant Inspection

Now, a completely portable fluorescent penetrant inspection kit will locate cracks, pores, leaks and other defects open to the surface in any solid material. This kit contains sensitive materials in push-button, pressurized spray cans. (Magnaflux Corp.)

For more data circle No. 41 on postcard, p. 65

The Iron Age Summary

Most Steel Market News Is Bad

Order backlogs are dropping and new business is slow coming in.

It looks like a tough first quarter. And no one looks for a real pickup until last half.

▪ Most of the news in steel was bad as 1957 drew to a close. Order backlogs were dropping and new orders were slow coming in. Ingot production over the holiday period was being cut sharply. Thousands of workers either were laid off or working a short week.

One company had practically shut down its plate mill until after the turn of the year. Other firms were using up inventories of semi-finished, cutting back on raw steel output.

Same Old Story—The story was the same everywhere: First quarter business for steel will be one of the toughest periods in years. Second quarter probably will improve some. But no one looks for a real upturn until the second half.

The sharp downturn was due largely to inventory cutting by steel users. In some respects the situation was comparable to 1954. But the mills are hopeful that business thinking will take a more optimistic turn earlier in the year than was the case in 1954.

Straw-in-the-Wind? — One encouraging note: Appliance makers, farm equipment builders, and even construction equipment firms appear to be selling more than they are making. This can't go on for long. Sooner or later these companies will have to step up their output and do some serious thinking about their steel inventory policies.

In Detroit, steel salesmen are edgy. When the phone rings they aren't sure whether it means a new order or whether it's a customer calling for a roll-back on delivery schedules. January orders are coming in, but not in any volume. February business also is showing up, but some of this new business is partially offset by order deferments. New car sales are still sluggish, with the medium price cars bearing the brunt of a so-so market.

Delivery Scramble—Mills are still working like a short-order cook on delivery promises. Some are making delivery in 24 hours. Wire producers are increasing their finished goods inventories.

Hot-rolled bars, which go into a broad cross-section of industrial and consumer products, are expected to show a decline in December. January will probably show little improvement. The order lag takes in automotive, fasteners, and most other industries.

Tinplate Outlook—Tinplate shipments continue to lag, but the mills are more hopeful. They feel canners and canmakers must step up order releases in January. Tinplate shipments in 1957 are expected to run a shade under 6 million tons. This would be 300,000 tons short of last year's 6.3 million tons.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week 1,639	Last Week 1,741	Month Ago 1,843	Year Ago 2,388
Ingot Index (1947-1949=100)	102.0	108.4	114.7	148.7
Operating Rates				
Chicago	65.0	71.0	73.0	101.0
Pittsburgh	48.0	63.0	73.0	90.0
Philadelphia	45.0	74.0	85.0	104.0
Valley	34.0	56.0*	68.0	84.0
West	68.0	80.0	84.0	100.0
Buffalo	61.0	63.5	78.0	105.0
Cleveland	55.0	68.0	66.0	104.0
Detroit	40.0	81.0	86.0	86.0
S. Ohio River	58.0	70.0*	82.0	98.0
South	72.5	71.0	60.5	92.0
Upper Ohio R.	58.0	63.0	63.0	96.0
St. Louis	55.0	76.0	87.0	94.0
Northeast	31.0	31.0	40.0	100.0
Aggregate	51.0	68.0	72.0	97.0

*Revised

Prices At a Glance

(cents per lb unless otherwise noted)	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.967	5.967	5.967	5.622
Pig Iron (Gross ton)	$66.42	$66.42	$66.42	$63.04
Scrap, No. 1 hvy (Gross ton)	$32.83	$32.00	$32.33	$63.50
No. 2 bundles	$24.50	$24.00	$24.33	$50.67
Nonferrous				
Aluminum ingot	28.10	28.10	28.10	27.10
Copper, electrolytic	27.00	27.00	27.00	36.00
Lead, St. Louis	12.80	12.80	13.30	15.80
Magnesium ingot	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	64.50
Tin Straits, N. Y.	92.375	92.875*	87.25	102.25
Zinc, E. St. Louis	10.00	10.00	10.00	13.50

Buyers Urged to Unify Controls

Makers of electrical and electronic controls want users to take advantage of their specialized knowledge.

If control equipment is properly engineered, they say, it can be a valuable aid in regulating operations.

▪ Today salesmen for electrical controls firms are usually engineers. By calling them in on a job early, the customer has the benefit of their specialized knowledge.

More and more, the electrical controls engineer is becoming a special consultant available to the customer at a moment's notice. Electrical and electronic controls manufacturers are rapidly becoming custom controls engineering firms. And the customer usually finds he can do his job better, at lower cost, by consulting them early in the game.

Watchful "Eyes"—As demands for modern production methods have required modern machines, controls have been called on to handle more complex problems. Individual controls for components of an automated operation are inadequate to the task.

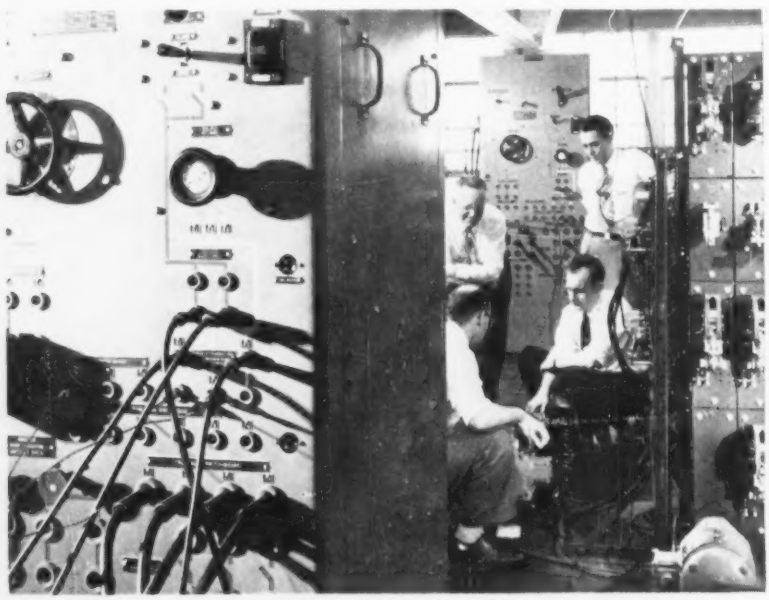
Today, a single unified control station can keep an eye on an entire operation. If properly engineered, it can do the job better than a battery of men. It can sense trouble before it causes a breakdown, and pinpoint the location. It can control the flow of work automatically. It can detect defects and make corrections. But this can only be the case if the controls equipment is engineered to the job.

Centralized for Economy—Most controls manufacturers, large and small, have a standard line of catalogue or "shelf" items. Often, engineering departments order various controls for equipment from the catalogue. Frequently they want individual units to control specific operations on the machine. These are then placed on the machine on an available-space or convenience basis.

But one special controls manufacturer points out this is not always the best — or most economical — way of adapting controls to a machine. In just about any multi-motor machine being built today it's cheaper to use a single control box rather than individual controls units. There are several reasons for this: Considerable space saving possible with a central control panel; savings in conduits and wiring; and usually fewer controls are needed. For example, a single switch can control all motors on a machine, instead of a switch box for each motor. Yet, individual control buttons can be placed conveniently around the machine.

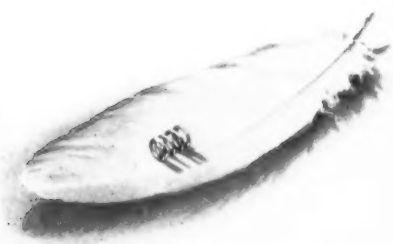
Deliveries Good — Because fortunes of electrical and electronic controls manufacturers are tied closely to those of the metalworking industry, slower business for machine tool makers has caused a corresponding drop in business for the controls industry.

Availability of electrical controls is good just about everywhere. Most manufacturers have increased prices for controls from 5-10 pct on some items within the past several months. Those who haven't boosted prices as yet expect to early next year. However, controls manufacturers expect to find competition tougher in the coming months. This will tend to temper general price hikes.



CONTROL DEVELOPMENT: Design of a new steel mill control system is discussed by engineers in the product development laboratory at the Cleveland plant of the Square D Co.

There's nothing more versatile than a spring



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STEEL PRODUCT MARKETS

Optimism Difficult In Slow Market

Fizzled hopes for first quarter sheet are typical of the problems sellers face.

Kaiser cuts base price in West on hot-rolled sheet and strip by $3 a ton.

▪ Steel sellers are trying to be optimistic about the market as the year closes but it isn't easy.

No mill products are showing any signs of starting '58 with a bang. Even the previously strong steel products, sheared mill plate and wide flanged structurals, are sagging.

The bright light of sheet hopes for the first quarter is a feeble flicker. Automotive steel buyers continue pushing January tonnage back into February. Further cutbacks in steel buying from Detroit are expected.

Straw in the Wind?—In an effort to fill the small orders for quick shipment that is demanded, the mills are bending over backwards. Schedules are juggled, semi-finished stocks are maintained at high levels, and cancelled orders re-assigned quickly. Many mills are as gloomy as the producer who says, "Unless there is a pickup soon, you can write off 1958 for sheets."

The flat-rolled market is fiercely competitive from mill to warehouse level. Kaiser Steel, for example, has reduced its base price on hot-rolled sheet and strip by $3 a ton. Reduction brings them down to the level of other Western mills on strip and places them $1 above on sheet.

Bars—A drop in shipments of hot-rolled bars in December is expected by **Pittsburgh** mills. They believe January tonnages will show little improvement. Contributing to the order lag are the cold finishers as well as such other users as automotive and fastener manufacturers. Only encouraging sign for the mills is improved buying of the farm implement makers, long inactive. **Midwest** warehouses are cutting back on their inventories of both hot-rolled and cold-finished bar. Cold-finished, in particular, is slow moving. On the **West Coast** delivery promises on cold-finished have dropped from 2-3 weeks to 1-2 weeks in a month.

Structurals — Demand, even for wide flange beams, will not reach the mill's capacity to produce in January, a large **Eastern** supplier indicates. Another producer in the area—Phoenix Iron & Steel Co.—closed down its structural mill at Phoenixville from Dec. 20 until the first full week in January. In the **Midwest** even wide flange shapes in the larger sizes are being offered for first quarter delivery. Some buyers there are cancelling February and March tonnage for this product. Structural sales are very slow on the **West Coast** with mills on four-day-a-week schedules.

Wire—Mills are operating on a day-to-day basis on orders for manufacturers' wire. This late in the month some are still receiving and filling orders for December delivery. Producers are increasing stocks of finished goods to make fast shipments. More competition for southern suppliers of welded wire fabric is coming. A new distributor setting up shop in Florida will be selling lower-priced imported product.

Pipe and Tubing—Production is due to slide in 1958 "to a level in line with overall steel output," according to a major mill. Much of the drop will be due to reduced orders for oil country seamless pipe. Inventory cuts by the users are catching up with the mills. Buyers want to discuss their requirements on a monthly, rather than a quarterly basis as before.

Delivery Promises at a Glance

	Pittsburgh	Chicago	Cleveland	Detroit	East	West Coast
CR Carbon Sheet	2-4 wks	2-4 wks	3-4 wks	3-5 wks	3-5 wks	4-6 wks
HR Carbon Sheet	1-2 wks	2-3 wks	2-3 wks	2-4 wks	2-4 wks	4-6 wks
CR Carbon Strip	2-4 wks	2-4 wks	3-4 wks	3-5 wks	3-5 wks	4-6 wks
HR Carbon Strip	1-2 wks	2-3 wks	2-3 wks	2-4 wks	2-4 wks	4-6 wks
HR Carbon Bars	1-2 wks	1-3 wks	2-3 wks	2-4 wks	2-4 wks	2-4 wks
CF Carbon Bars	1-4 wks	1-4 wks	1-3 wks		2-4 wks	1-2 wks
Heavy Plate	2-8 wks	4-6 wks			4-8 wks	8 wks
Light Plate	1-4 wks	2-3 wks	2-3 wks		1-5 wks	8 wks
Merchant Wire	1 wk	1 wk	1 wk		Wk or less	3-4 wks
Oil Country Goods	2-6 wks	2-3 wks	3-4 wks		2-5 wks	
Linepipe	3-6 mos	10 wks	1st Q.		4-6 mos	5-6 wks
Buttweld Pipe	1 wk	1 wk	1 wk	2-3 wks	1-2 wks	3-4 wks
Std. Structurals	2-8 wks	3-4 wks		4-8 wks	4-8 wks	4-6 wks
CR Stainless Sheet	2-4 wks		1-2 wks	1-2 wks	2-4 wks	
CR Stainless Strip	2-4 wks		1-2 wks	1-2 wks	2-4 wks	

COMPARISON OF PRICES

(Effective Dec. 23, 1957)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	Dec. 23 1957	Dec. 17 1957	Nov. 26 1957	Dec. 25 1956
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.925¢	4.925¢	4.925¢	4.675¢
Cold-rolled sheets	6.05	6.05	6.05	5.75
Galvanized sheets (10 ga.)	6.60	6.60	6.60	6.30
Hot-rolled strip	4.925	4.925	4.925	4.675
Cold-rolled strip	7.17	7.17	7.17	6.870
Plate	5.12	5.12	5.12	4.87
Plates, wrought iron	13.15	13.15	13.15	10.40
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	47.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.30	$10.30	$10.30	$9.95
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	8.65
Special coated mfg. ternes	9.55	9.55	9.55	9.20
Bars and Shapes: (per pound)				
Merchant bar	5.425¢	5.425¢	5.425¢	5.075¢
Cold finished bars	7.30	7.30	7.30	6.85
Alloy bars	6.475	6.475	6.475	6.125
Structural shapes	5.275	5.275	5.275	5.00
Stainless bars (No. 302)	45.00	45.00	45.00	40¾-43¼
Wrought iron bars	14.45	14.45	14.45	11.50
Wire: (per pound)				
Bright wire	7.65¢	7.65¢	7.65¢	7.20¢
Rails: (per 100 lb.)				
Heavy rails	$5.525	$5.525	$5.525	$5.075
Light rails	6.50	6.50	6.50	6.00
Semifinished Steel: (per net ton)				
Rerolling billets	$77.50	$77.50	$77.50	$74.00
Slabs, rerolling	77.50	77.50	77.50	74.00
Forging billets	96.00	96.00	96.00	91.50
Alloy blooms, billets, slabs	114.00	114.00	114.00	107.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.15¢	6.15¢	6.15¢	5.80¢
Skelp	4.875	4.875	4.875	4.225
Finished Steel Composite: (per pound)				
Base price	5.967¢	5.967¢	5.967¢	5.622¢

	Dec. 23 1957	Dec. 17 1957	Nov. 26 1957	Dec. 25 1956
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.51	$70.51	$70.51	$67.76
Foundry, Valley	66.50	66.50	66.50	63.00
Foundry, Southern Cin'ti	71.65	71.65	71.65	67.17
Foundry, Birmingham	62.50	62.50	62.50	59.00
Foundry, Chicago	66.50	66.50	66.50	63.00
Basic, del'd Philadelphia	70.01	70.01	70.01	66.84
Basic, Valley furnace	66.00	66.00	66.00	62.50
Malleable, Chicago	66.50	66.50	66.50	63.00
Malleable, Valley	66.50	66.50	66.50	63.00
Ferromanganese, 74-76 pct Mn, cents per lb‡	12.25	12.25	12.25	11.75-12.75
Pig Iron Composite: (per gross ton)				
Pig iron	$66.42	$66.42	$66.42	$63.04
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$32.50	$32.50	$33.50	$65.50
No. 1 steel, Phila area	35.50	33.00	33.00	62.50
No. 1 steel, Chicago	30.50	30.50	30.50	62.50
No. 1 bundles, Detroit	21.50	21.50	22.50	60.50
Low phos., Youngstown	33.50	33.50	30.50	70.50
No. 1 mach'y cast, Pittsburgh	50.50	50.50	50.50	61.50
No. 1 mach'y cast, Philadel'a	50.50	50.50	50.50	60.50
No. 1 mach'y cast, Chicago	42.50	41.50	40.50	57.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$32.83	$32.00	$32.33	$63.50
No. 2 bundles	24.50	24.00	24.33	50.67
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.38	$15.38	$15.38	$15.50
Foundry coke, prompt	$17.50-$19	$17.50-$19	$17.50-$19	$18-19
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	27.00	27.00	27.00	36.00
Copper, Lake, Conn.	27.00	27.00	27.00	36.00
Tin, Straits, N. Y.	92.375†	92.875*	87.25	102.25
Zinc, East St. Louis	10.00	10.00	10.00	13.50
Lead, St. Louis	12.80	12.80	13.30	15.80
Aluminum, virgin ingot	28.10	28.10	28.10	27.10
Nickel, electrolytic	74.00	74.00	74.00	64.50
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	33.00	33.00	33.00	33.00

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

INDEX TO PRICE PAGES

IRON AND STEEL SCRAP MARKETS

East Coast Prices Edge Upward

Confused Philadelphia market goes up, but with a wide spread.

Nationwide, the market is still deep in the doldrums with scant hope for a rebound.

■ The market took its first upward nudge since mid-June. On the basis of higher sales in Philadelphia, The IRON AGE No. 1 heavy melting composite price edged upward from $32, where it had stayed for three weeks, to $32.83.

The upturn was by no means clear-cut, even in Philadelphia. Wide differences of opinion forced a $3 spread in the market there.

Elsewhere, a slight upturn in electric furnace grades in Chicago was the only evidence of strength. The St. Louis market, which had resisted to some extent, took a $3 drop.

The principal significance of the Philadelphia purchase is that almost any buy of representative tonnage may have to be higher than present quoted prices.

Meanwhile, The Institute of Scrap Iron & Steel is planning to protest a proposed freight rate increase that would add up to 40¢ per ton to scrap shipping costs.

The move follows a new request for freight rate increases for selected commodities which would hit scrap. The trade fears that in the current depressed market it would be forced to absorb the added charge.

Pittsburgh—Prices of all grades are unchanged. There is no strength in the market, but dealers are stubbornly resisting further price drops. Brokers report difficulty filling old orders from a nearby district for No. 1 heavy melting at $35. Low phos has been sold for $38 and higher. However, there was not enough activity to establish a true market. Industrial lists are providing the only tonnage movement and these have been edging toward a $30 level. However, deliveries of industrial scrap are running behind listed tonnages and next month's tonnage is expected to be lower.

Chicago — Prices continued to hold firm or inch up from previous levels. Increasing buying pressure, from electric furnace grades as well as the depressed price levels, combined to force consumer asking and buying prices up. This brings consumer buying prices more fully in line with broker buying and scrap producer price levels.

Philadelphia — The market assumed a $3 spread for steelmaking grades with confusion rampant. An area mill paid $37 for No. 1 heavy melting steel while another mill was reported offering $34, but with little if any response.

New York — Steelmaking grades went up $1 on the basis of export offers and in sympathy with higher prices in an adjacent consuming area.

Detroit—Failure of local mills to enter the market this month has increased dealer pessimism here. And mills haven't indicated they will show much if any interest in scrap next month, which further tends to depress market prospects.

Cleveland—Industrial lists closing this week in the Cleveland area for January total about 28,000 tons compared with 42,000 tons, an estimate for this month that was not reached. About 40 pct of the tonnage in December went to dealer yards and the rest was largely scattered in the Valley and out of district. Dealer collections are still dropping while the entire market outlook continues poor.

St. Louis—The market here is in a confused state. One leading mill, buying on a 30-day basis, has issued few new orders, but has outstanding unfilled orders at unchanged prices and has issued no cancellations. Another leading mill has reduced its price and reports it is getting scrap, but is buying on a 10-day delivery basis. Movement is slow.

Birmingham—Buying and selling is at a minimum in this district. There were minute amounts of electric furnace and cast items bought last week at unchanged prices. Buyers and brokers predict there will be little activity for some time. Consumers are not sure they will return to the market at all in January. The export market is also quiet.

Cincinnati — Dealers are still reluctant to sell at present prices. Year-end slowdowns are cutting into scrap consumption, darkening the market outlook further. Bidding on lists is expected to be lethargic with tail-end lots going at reduced prices.

Buffalo — The market continues inactive with prices unchanged for the moment. Dealers see little hope for price increases. A leading mill shut down another openhearth this month.

Boston—No. 2 bundles and machinery cast both edged off again in a very dull market. Like other markets, little hope for improvement is seen here.

West Coast — Brisk export to Japan is the only life evident on the scrap front. Six cargoes are due to sail by mid-January. Domestic market is dead. Many look for a $2 to $3 drop across the board.

ROBERT S. STEVENSON

Portrait by Fabian Bachrach

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SCRAP PRICES *(Effective Dec. 23, 1957)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$32.00 to $32.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	32.00 to 33.00
No. 1 factory bundles	34.00 to 35.00
No. 2 bundles	28.00 to 29.00
No. 1 busheling	32.00 to 33.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and trn. turn.	16.00 to 17.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Low phos. punchings, plate	35.00 to 36.00
Heavy turnings	31.00 to 32.00
No. 1 RR hvy. melting	36.00 to 37.00
Scrap rails, random lgth.	47.00 to 48.00
Rails 2 ft and under	55.00 to 56.00
RR steel wheels	45.00 to 46.00
RR spring steel	45.00 to 46.00
RR couplers and knuckles	45.00 to 46.00
No. 1 machinery cast	50.00 to 51.00
Cupola cast	39.00 to 40.00
Heavy breakable cast	37.00 to 38.00

Chicago

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	30.00 to 31.00
No. 1 factory bundles	35.00 to 36.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	30.00 to 31.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos. forge crops	44.00 to 46.00
Low phos. punchings, plate	42.00 to 43.00
Low phos. 2 ft and under	41.00 to 42.00
No. 1 RR hvy. melting	35.00 to 36.00
Scrap rails, random lgth.	43.00 to 44.00
Rerolling rails	50.00 to 51.00
Rails 2 ft and under	48.00 to 50.00
Locomotive tires, cut	44.00 to 46.00
Cut bolster & side frames	42.00 to 43.00
Angle and splice bars	47.00 to 48.00
RR steel car axles	50.00 to 51.00
RR couplers and knuckles	44.00 to 45.00
No. 1 machinery cast	42.00 to 43.00
Cupola cast	37.00 to 38.00
Heavy breakable cast	35.00 to 36.00
Cast iron brake shoes	36.00 to 37.00
Cast iron wheels	41.00 to 42.00
Malleable	48.00 to 49.00
Stove plate	35.00 to 36.00
Steel car wheels	45.00 to 46.00

Philadelphia Area

No. 1 hvy. melting	$34.00 to $37.00
No. 2 hvy. melting	30.00 to 33.00
No. 1 dealer bundles	34.00 to 37.00
No. 2 bundles	24.00 to 27.00
No. 1 busheling	34.00 to 37.00
Machine shop turn.	18.00 to 19.00
Mixed bor. short turn.	22.00 to 23.00
Cast iron borings	22.00 to 23.00
Shoveling turnings	22.00 to 23.00
Clean cast chem. borings	30.00 to 31.00
Low phos. 2 ft and under	39.00 to 40.00
Low phos. 2 ft and under	40.00 to 41.00
Low phos. punchings	40.00 to 41.00
Elec. furnace bundles	36.00 to 37.00
Heavy turnings	30.00 to 31.00
RR steel wheels	45.00 to 46.00
RR spring steel	45.00 to 46.00
Rails 18 in. and under	63.00 to 64.00
Cupola cast	36.00 to 38.00
Heavy breakable cast	36.00 to 37.00
Cast iron car wheels	40.00 to 41.00
Malleable	53.00 to 56.00
Unstripped motor blocks	32.00 to 33.00
No. 1 machinery cast	48.00 to 49.00

Cleveland

No. 1 hvy. melting	$27.00 to $28.00
No. 2 hvy. melting	21.00 to 22.00
No. 1 dealer bundles	27.00 to 28.00
No. 1 factory bundles	31.00 to 32.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	27.00 to 28.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Cut structural & plates, 2 ft & under	35.00 to 36.00
Drop forge flashings	27.00 to 28.00
Low phos. punchings, plate	28.00 to 29.00
Foundry steel, 2 ft & under	33.00 to 34.00
No. 1 RR heavy melting	32.00 to 33.00
Rails 2 ft and under	53.00 to 54.00
Rails 18 in. and under	54.00 to 55.00
Railroad grate bars	14.00 to 15.00
Steel axle turnings	15.00 to 16.00
Railroad cast	42.00 to 43.00
No. 1 machinery cast	44.00 to 45.00
Stove plate	40.00 to 41.00
Malleable	54.00 to 55.00

Youngstown

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	30.00 to 31.00
No. 2 bundles	23.00 to 24.00
Machine shop turn.	13.00 to 14.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos. plate	33.00 to 34.00

Buffalo

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	25.50 to 26.50
No. 1 busheling	28.00 to 29.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	22.50 to 23.50
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	14.00 to 15.00
Low phos. plate	34.00 to 35.00
Scrap rails, random lgth.	40.00 to 41.00
Rails 2 ft and under	50.00 to 51.00
RR steel wheels	37.00 to 38.00
RR spring steel	33.00 to 34.00
RR couplers and knucklers	33.00 to 34.00
No. 1 machinery cast	40.00 to 41.00
No. 1 cupola cast	35.00 to 36.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$19.00 to $20.00
No. 2 hvy. melting	16.00 to 17.00
No. 1 dealer bundles	19.00 to 20.00
No. 2 bundles	14.00 to 15.00
No. 1 busheling	18.00 to 19.00
Drop forge flashings	18.00 to 19.00
Machine shop turn.	7.00 to 8.00
Mixed bor. and turn.	9.00 to 10.00
Shoveling turnings	9.00 to 10.00
Cast iron borings	9.00 to 10.00
Low phos. punch'gs plate	19.00 to 20.00
No. 1 cupola cast	27.00 to 28.00
Heavy breakable cast	22.00 to 23.00
Stove plate	22.00 to 23.00
Automotive cast	30.00 to 31.00

St. Louis

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	34.00 to 35.00
No. 2 bundles	23.00 to 24.00
Machine shop turn.	15.00 to 16.00
Cast iron borings	17.00 to 18.00
Shoveling turnings	17.00 to 18.00
No. 1 RR hvy. melting	37.00 to 38.00
Rails, random lengths	41.00 to 42.00
Rails, 18 in. and under	47.00 to 48.00
Angles and splice bars	40.00 to 41.00
Std. steel car axles	43.00 to 44.00
RR specialties	42.00 to 43.00
Cupola cast	42.00 to 43.00
Heavy breakable cast	35.00 to 36.00
Cast iron brake shoes	37.00 to 38.00
Stove plate	36.50 to 37.50
Cast iron car wheels	32.00 to 33.00
Rerolling rails	46.00 to 47.00
Unstripped motor blocks	32.00 to 33.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$23.00 to $24.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	23.00 to 24.00
No. 2 bundles	14.00 to 15.00
No. 1 busheling	23.00 to 24.00
Elec. furnace, 3 ft & under	29.00 to 30.00
Machine shop turn.	8.50 to 9.50
Mixed bor. and short turn.	9.50 to 10.50
Shoveling turnings	10.00 to 11.00
Clean cast chem. borings	16.00 to 17.00
No. 1 machinery cast	32.00 to 33.00
Mixed cupola cast	27.00 to 28.00
Heavy breakable cast	25.00 to 26.00
Stove plate	26.00 to 27.00
Unstripped motor blocks	27.00 to 28.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	27.00 to 28.00
No. 2 dealer bundles	20.00 to 21.00
Machine shop turn.	11.00 to 12.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Clean cast. chem. borings	23.00 to 24.00
No. 1 machinery cast.	34.00 to 35.00
Mixed yard cast.	29.00 to 30.00
Charging box cast.	30.00 to 31.00
Heavy breakable cast.	30.00 to 31.00
Unstripped motor blocks	27.00 to 28.00

Birmingham

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	16.00 to 17.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	12.00 to 13.00
Electric furnace bundles	35.00 to 36.00
Elec. furnace, 3 ft & under	33.00 to 34.00
Bar crops and plate	38.00 to 39.00
Structural and plate, 2 ft.	38.00 to 39.00
No. 1 RR hvy. melting	34.00 to 35.00
Scrap rails, random lgth.	41.00 to 42.00
Rails, 18 in. and under	48.00 to 49.00
Angles & splice bars	40.00 to 41.00
Rerolling rails	47.00 to 48.00
No. 1 cupola cast.	48.00 to 49.00
Stove plate	47.00 to 48.00
Charging box cast.	22.00 to 23.00
Cast iron car wheels	36.00 to 37.00
Unstripped motor blocks	38.00 to 39.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	20.00 to 21.00
Machine shop turn.	14.00 to 15.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos., 18 in. and under	37.00 to 38.00
Rails, random length	42.00 to 43.00
Rails, 18 in. and under	52.00 to 53.00
No. 1 cupola cast.	36.00 to 37.00
Hvy. breakable cast.	32.00 to 33.00
Drop broken cast.	47.00 to 48.00

San Francisco

No. 1 hvy. melting	$36.00
No. 2 hvy. melting	34.00
No. 1 dealer bundles	34.00
No. 2 bundles	26.00
Machine shop turn.	20.00
Cast iron borings	20.00
No. 1 RR hvy. melting	36.00
No. 1 cupola cast.	45.00

Los Angeles

No. 1 hvy. melting	$36.00
No. 2 hvy. melting	34.00
No. 1 dealer bundles	32.00
No. 2 bundles	24.00
Machine shop turn.	12.00
Shoveling turnings	15.00
Cast iron borings	15.00
Elec. furn. 1 ft and under (foundry)	47.00
No. 1 RR hvy. melting	37.00
No. 1 cupola cast.	$41.00 to 42.00

Seattle

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	32.00
No. 2 bundles	26.00
No. 1 cupola cast.	38.00
Mixed yard cast.	38.00

Hamilton, Ont.

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	29.00
No. 1 dealer bundles	34.00
No. 2 bundles	24.00
Mixed steel scrap	29.00
Busheling	24.00
Bush., new fact, prep'd	34.00
Bush., new fact, unprep'd	28.00
Machine shop turn.	19.00
Short steel turn.	23.00
Mixed bor. and turn.	19.00
Rails, rerolling	43.00
Cast scrap	$44.00 to 49.00

NONFERROUS MARKETS

Little Activity In Quiet Market

Holiday breathing spell is welcomed as nonferrous markets end a hectic year.

Overproduction marked all metals, with most prices falling sharply.

■ Activity is reduced to a minimum in just about all nonferrous markets.

Not for some time has this breathing spell been so welcome. Although few peacetime years have been as hectic as 1957, business was not all bad.

Downtrend Visible — But the trend has definitely been toward softer markets. There are very few gains over 1956. And those who held their own really had to scramble.

Primary prices, with two notable exceptions, fell sharply. In both exceptions, there is more there than meets the initial glance.

Here's how the major metals will end this year, compared with prices at the end of 1956:

	(cents per lb)	
	1957	1956
Aluminum ingot	28.10	27.10
Copper, custom smelter	25.50	35.00
Copper, producers	27.00	36.00
Zinc, E. St. Louis	10.00	13.50
Lead, St. Louis	12.80	15.80
Tin, New York	92.50	101.00
Magnesium ingot	36.00	36.00

Here's the picture, metal-by-metal:

Aluminum — This is an exception. The price of primary metal moved up 1¢ per lb right after wage hikes in August. This was despite a weakening demand. However, the sharp competition showed up in mill products. There was quite a bit of price adjusting and discounting, especially late in the year. Independent fabricators complained bitterly about the Big 3 producers' marketing methods. But statistics presented by producers to the Yates subcommittee of the House Small Business Committee indicated that independents are increasing their share of the market.

Supply will continue to outweigh demand. Producers have substantial expansion programs, although some are being stretched out. They are betting on a long term boost in consumption. The price picture in 1958 probably will repeat 1957.

Copper—Prices at the end of this year are down about 9¢ per lb for both producers and custom smelters. This will show up in sharp drops in income.

Expansion projects launched by producers during the severe shortages several years ago began bearing fruit in 1957. It turned out to be bitter fruit. The shortages were caused more by extended strikes than by lack of capacity. Many copper producers sold almost as much metal this year as in 1956, but they still have plenty left over. They are attempting to solve the problem with cutbacks. These will be made gradually.

The market is likely to stay soft at least through the first quarter 1958.

Zinc and Lead — Cutbacks in government stockpiling and impotency of the barter program emphasized the fact that there is just too much of both metals for demand. The domestic miners blame the situation on imports. The smelters, working foreign ores, say it is the fault of marginal and high cost U. S. mines.

The miners have asked for increases in tariffs. They'll probably get them. They have requested quotas on imports.

Prices are probably near the floor, but will be vulnerable, at least through the first quarter.

Tin—The 10¢ drop in tin price this year is no surprise. It was out of line last year, put there by artificial factors.

Buying by the buffer stock of the International Tin Agreement kept the price from sliding too far, too fast. Continued buying, and the export quotas inflicted on tin producers, will probably keep the price between 90¢ and 96¢ per lb through most of 1958.

Magnesium — The price hasn't changed since August 1956. Supply has been up slightly, while demand stays about the same. The price is not likely to change. Dow Chemical will make substantial investments to modernize its newly acquired Velasco, Tex., plant and is not likely to move the price.

Tin prices for the week: Dec. 18—92.625; Dec. 19—92.50; Dec. 20 — 92.50; Dec. 23 — 92.375*; Dec. 24—92.375*.
* Estimate.

Primary Prices

(cents per lb)	Current price	last price	date of change
Aluminum pig	28.00	25.00	8 1 57
Aluminum ingot	28.10	27.10	8 1 57
Copper (E)	27.00	28.50	9 3 57
Copper (CS)	25.50	25.00	12 16 57
Copper (L)	27.00	28.50	9 3 57
Lead, St. L.	12.80	13.30	12 2 57
Lead, N. Y.	13.00	13.50	12 2 57
Magnesium ingot	36.00	34.00	8 13 56
Magnesium pig	35.25	33.75	8 13 56
Nickel	74.00	64.50	12 6 56
Titanium sponge	165.250	165.225	5 5 57
Zinc, E. St. L.	10.00	10.50	7 1 57
Zinc, N. Y.	10.50	11.00	7 1 57

ALUMINUM: 99% ingot frt allwd. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic, (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig, Velasco, Tex. NICKEL: Port Colbourne, Canada. ZINC: prime western. TIN: see above; other primary prices, pg. 83.

NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate
("F" temper except 6061-0)

Alloy	.032	.081	136-249	250-3
1100, 3003	46.6	44.3	43.6	42.7
5052	54.0	48.9	47.2	45.4
6061-0	51.4	47.0	45.2	45.1

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	45.0-46.8	60.4-64.1
12-14	45.7-47.2	61.3-65.8
24-26	49.0-49.5	72.1-76.8
36-38	58.0-58.6	96.2-99.8

Screw Machine Stock—2011-T-3

Size*	¼	⅝-⅞	¾-1	1¼-1½
Price	63.0	62.5	61.0	58.6

Roofing Sheet, Corrugated
(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1,420	$1,893	$2,367	$2,839
.024 gage	1,774	2,366	2,957	3,549

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	250-3.00	250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	108.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Red	Tube
Copper	50.13	.....	47.36	50.32
Brass, 70/30	44.02	44.56	45.26	46.93
Brass, Low	46.50	47.04	46.44	49.31
Brass, R L	47.37	47.91	47.31	50.18
Brass, Naval	48.27	.....	42.58	51.68
Munts Metal	46.39	.....	42.20	.....
Comm. Bs.	48.78	49.32	48.72	51.34
Mang. Bs.	52.01	.....	46.11	.....
Phos. Bs. 5%	69.07	.....	69.57	.....

Free Cutting Brass Rod 32.30

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $9.50-$10.60; alloy, $14.75; Plate, HR, commercially pure, $8.00-$8.75; alloy, $10.75. Wire, rolled and/or drawn, commercially pure, $7.50-$8.00; alloy $10.00; Bar, HR or forged, commercially pure, $6.15-$6.40; alloy, $6.15-$6.35; billets, HR, commercially pure, $6.00-$6.25; alloy, $6.00-$6.20.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex. 33.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Calcium, 99.8%, small lots ..... $ 4.55
Chromium, 99.8% metallic basis ... $ 1.31
Cobalt, 97-99% (per lb) ... $2.00 to $2.07
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 39.50 to 53.50
Gold, U. S. Treas, per troy oz. $35.00
Indium, 99.9%, dollars per troy oz. $ 2.25
Iridium, dollars per troy oz. ... $80 to $90
Lithium, 98% ..... $11.00 to $14.00
Magnesium, sticks, 100 to 500 lb. ... 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $225 to $230
Nickel oxide sinter at Copper Cliff, Ont., contained nickel 71.25
Palladium, dollars per troy oz. .. $23 to $24
Platinum, dollars per troy oz. .. $77 to $80
Rhodium ..... $120.00 to $125.00
Silver ingots (¢ per troy oz.) 89.875
Thorium, per kg. $43.00
Vanadium ..... $ 3.45
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 27.25
No. 120 ..... 26.25
No. 123 ..... 25.50
80-10-10 ingot
No. 395 ..... 31.25
No. 315 ..... 29.25
88-10-2 ingot
No. 210 ..... 38.25
No. 215 ..... 34.00
No. 245 ..... 30.75
Yellow ingot
No. 405 ..... 22.75
Manganese bronze
No. 421 ..... 24.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 25.25-26.50
0.60 copper max. 25.00-26.25
Piston alloys (No. 122 type) . 24.25-25.00
No. 12 alum. (No. 2 grade) ... 22.00-23.00
108 alloy 22.25-23.50
195 alloy 25.25-26.75
13 alloy (0.60 copper max.) .. 25.00-26.25
AXS-679 ..... 22.25-23.50

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½% 23.00-24.00
Grade 2—92-95% 21.75-22.50
Grade 3—90-92% 20.50-21.50
Grade 4—85-90% 18.25-19.25

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	23	22¼
Yellow brass	17⅝	15⅝
Red brass	20¼	19⅛
Comm. bronze	21	20¼
Mang. bronze	16⅛	15⅝
Yellow brass rod ends	17⅛	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 20⅝
No. 2 copper wire 19¼
Light copper 17
*Refinery brass 18⅝
Copper bearing material 18¼
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 20⅝
No. 2 copper wire 19¼
Light copper 17
No. 1 composition 19¼
No. 1 comp. turnings 18⅝
Hvy. yellow brass solids 13
Brass pipe 16⅛
Radiators 15¼

Aluminum

Mixed old cast. ..... 13½—14
Mixed new clips ..... 16 —16⅛
Mixed turnings, dry ..... 14 —15

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 18¼—18¾
No. 2 copper wire ..... 16¼—16¾
Light copper ..... 14¾—15¼
Auto radiators (unsweated) ..... 11¾—12
No. 1 composition ..... 15½—16
No. 1 composition turnings ... 15 —15⅛
Cocks and faucets ..... 12 —12⅛
Clean heavy yellow brass .... 11 —11⅛
Brass pipe ..... 12½—12
New soft brass clippings ..... 13 —13⅛
No. 1 brass rod turnings ..... 11¼—11¾

Aluminum

Alum. pistons and struts ..... 5½— 6
Aluminum crankcases ..... 10½—11
1100 (2S) aluminum clippings 14 —14⅛
Old sheet and utensils ..... 10½—11
Borings and turnings ..... 6½— 7
Industrial castings ..... 10½—11
2024 (24S) clippings ..... 12 —12⅛

Zinc

New zinc clippings ..... 4 — 4⅛
Old zinc ..... 3 — 3¼
Zinc routings ..... 1¾— 2
Old die cast scrap ..... 1½— 1⅝

Nickel and Monel

Pure nickel clippings 42-45
Clean nickel turnings 37-40
Nickel anodes 42-45
Nickel rod ends 42-45
New Monel clippings 28-29
Clean Monel turnings 20-23
Old sheet Monel 25-26
Nickel silver clippings, mixed. 18
Nickel silver turnnigs, mixed. 15

Lead

Soft scrap lead ..... 8½— 9
Battery plates (dry) ..... 3½— 3¾
Batteries, acid free ..... 2¾— 3

Miscellaneous

Block tin ..... 75 —76
No. 1 pewter ..... 59 —60
Auto babbitt ..... 39 —40
Mixed common babbitt ..... 11 —11⅛
Solder joints ..... 14½—15
Siphon tops 42
Small foundry type ..... 12 —12⅛
Monotype ..... 12 —12¼
Lino. and stereotype ..... 11 —11¼
Electrotype ..... 10 —10¼
Hand picked type shells ..... 7 — 7½
Lino. and stereo. dross ..... 3 — 3¼
Electro dross ..... 2½— 2¾

(Effective Dec. 20, 1957)

Bulk evidently producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL PRICES

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$114.00 *B3*		5.325 *B3*	7.80 *B3*	5.325 *B3*						
	Buffalo, N. Y.	$77.50 *B3, B5*	$96.00 *B3, B5*	$114.00 *B3, B5*	6.225 *B3*	5.325 *B3*	7.80 *B3*	5.325 *B3*	4.925 *B3, B5*	7.15 *S10*	7.325 *B3*			
	Phila., Pa.									7.70 *P15*				
	Harrison, N. J.													15.05 *C11*
	Conshohocken, Pa.		$101.00 *A2*	$121.00 *A2*					4.975 *A2*	7.20 *A2*	7.325 *A2*			
	New Bedford, Mass.									7.60 *R6*				
	Johnstown, Pa.	$77.50 *B3*	$96.00 *B3*	$114.00 *B3*		5.325 *B3*	7.80 *B3*							
	Boston, Mass.									7.70 *T8*				15.40 *T8*
	New Haven, Conn.									7.60 *D1*				
	Baltimore, Md.									7.15 *T8*				
	Phoenixville, Pa.					5.325 *P2*		5.325 *P2*						
	Sparrows Pt., Md.								4.925 *B3*		7.325 *B3*			
	Bridgeport, Wallingford, Conn.			$114.00 *N8*						7.60 *W1*				
	Pawtucket, R. I.									7.70 *N7*				15.40 *N7*
	Worcester, Mass.									7.70 *A6*				15.20 *T8*
MIDDLE WEST	Alton, Ill.								5.125 *L1*					
	Ashland, Ky.								4.925 *A7*					
	Canton-Massillon, Dover, Ohio		$96.00 *R5*	$114.00 *R5, T5*						7.15 *G4*		10.45 *G4*		14.85 *C11*
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	$77.50 *U1, R5*	$96.00 *U1, R5, W8*	$114.00 *U1, R5, W8*	6.225 *U1*	5.275 *U1, W8, P11*	7.75 *U1, Y1, W8*	5.275 *U1*	4.925 *W8, N4, A1*	7.25 *A1, T8, M8*			8.10 *W8, S9, I5*	15.05 *A1, S9, G4*
	Cleveland, Ohio									7.15 *A6, J5*		10.45 *A6*	8.10 *J5*	
	Detroit, Mich.			$114.00 *R5*					5.025 *G5, M2*	7.25 *M2, D1, D2, G5, P11*	7.425 *G5*	10.60 *D2* 10.55 *G5*	8.10 *G5*	
	Anderson, Ind.									7.15 *G4*				
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$77.50 *U1*	$96.00 *U1*	$114.00 *U1, Y1*		5.275 *U1, I5*	7.75 *U1, I5*	5.275 *I5*	4.925 *U1, I5, Y1*	7.15 *Y1*	7.325 *U1, I5, Y1*	10.60 *Y1*	8.10 *U1, Y1*	
	Sterling, Ill.	$77.50 *N4*				5.275 *N4*			5.025 *N4*					
	Indianapolis, Ind.									7.30 *J5*				15.20 *J5*
	Newport, Ky.												8.10 *A9*	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		$96.00 *S1, C10*	$114.00 *C10, S1*					4.925 *R3, S1*	7.15 *R3, T4, S1*	7.325 *R3, S1*	10.50 *S1* 10.45 *R3*	8.10 *S1*	15.05 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Aliquippa, Pa.	$77.50 *U1, P6*	$96.00 *U1, C11, P6*	$114.00 *U1, C11, B2*	6.225 *U1*	5.275 *U1, J5*	7.75 *U1, J5*	5.275 *U1*	4.925 *P6*	7.15 *J5, B4, S7*			8.10 *S9*	15.05 *S9*
	Weirton, Wheeling, Follansbee, W. Va.				6.225 *W3*	5.275 *W3*			4.925 *W3*	7.15 *W3, F5*	7.325 *W3*	10.50 *W3*		
	Youngstown, Ohio	$77.50 *R5*	$96.00 *Y1, C10*	$114.00 *Y1*			7.75 *Y1*			7.15 *Y1, J5*	7.325 *U1, Y1*	10.65 *Y1*	8.10 *U1, Y1*	15.05 *J5* 10.65 *Y1*
WEST	Fontana, Cal.	$88.00 *K1*	$105.50 *K1*	$135.00 *K1*		6.075 *K1*	8.55 *K1*	6.225 *K1*	5.675 *K1*	9.00 *K1*				
	Geneva, Utah		$96.00 *C7*			5.275 *C7*	7.75 *C7*							
	Kansas City, Mo.					5.375 *S2*	7.85 *S2*						8.35 *S2*	
	Los Angeles, Torrance, Cal.		$105.50 *B2*	$134.00 *B2*		5.975 *C7, B2*	8.45 *B2*		5.675 *C7, B2*	9.05 *J5*			9.30 *B2*	17.25 *J5*
	Minnequa, Colo.					5.575 *C6*			6.025 *C6*	9.10 *K1*				
	Portland, Ore.					6.025 *B2*								
	San Francisco, Niles, Pittsburg, Cal.		$105.50 *B2*			5.925 *B2*	8.40 *B2*		5.675 *C7, B2*					
	Seattle, Wash.		$109.50 *B2*			6.025 *B2*	8.50 *B2*		5.925 *B2*					
SOUTH	Atlanta, Ga.					5.475 *A8*			5.125 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$77.50 *T2*	$96.00 *T2*			5.275 *T2, R3, C6*	7.75 *T2*		4.925 *T2, R3, C6*		7.325 *T2*			
	Houston, Lone Star, Texas		$101.00 *S2*	$119.00 *S2*		5.375 *S2*	7.85 *S2*						8.35 *S2*	

(Effective Dec. 20, 1957)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot rolled 18 ga. & hvyr.	Cold-rolled	Galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.			Coke* 1.25 lb. base box	Electro* 0.25 lb. base box	Hollowware Enameling 24 ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.925 *B8*	6.05 *B8*				7.275 *B8*	8.975 *B8*			6.15 *W6*			
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	4.975 *A2*	6.10 *A2*				7.325 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										6.15 *B8*			
	Fairless, Pa.	4.975 *U1*	6.10 *U1*				7.325 *U1*	9.025 *U1*				$10.15 *U1*	$8.85 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.925 *B8*	6.05 *B8*	6.60 *B8*			7.275 *B8*	8.975 *B8*	9.725 *B8*		6.25 *B8*	$10.15 *B8*	$8.85 *B8*	
	Worcester, Mass.										6.15 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										6.35 *L1*			
	Ashland, Ky.	4.925 *A7*		6.60 *A7*	6.625 *A7*									
	Canton-Massillon, Dover, Ohio			6.60 *R8, R1*										
	Chicago, Joliet, Ill.	4.925 *B8, A1*					7.275 *U1*				6.15 *A5, R8, W8, N4, K2*			
	Sterling, Ill.										6.25 *N4, K2*			
	Cleveland, Ohio	4.925 *R8, J8*	6.05 *R8, J8*		6.625 *R8*		7.275 *R8, J8*	8.975 *R8, J8*			6.15 *A5*			
	Detroit, Mich.	5.025 *G8, M2*	6.15 *G1* 6.05 *M2*				7.375 *G8*	9.075 *G8*						
	Newport, Ky.	4.925 *A1*	6.05 *A1*											
	Gary, Ind. Harbor, Indiana	4.925 *U1, I8, Y1*	6.05 *U1, I8, Y1*	6.60 *U1, I8*	6.625 *U1, I8, Y1*	7.00 *U1*	7.275 *U1, Y1, I8*	8.975 *U1, Y1*			6.15 *Y1*	$10.05 *U1, Y1*	$8.75 *I8, U1, Y1*	7.50 *U1, Y1*
	Granite City, Ill.	5.125 *G2*	6.25 *G2*	6.80 *G2*	8.825 *G2*								$8.85 *G2*	7.60 *G2*
	Kokomo, Ind.			6.70 *C9*							6.25 *C9*			
	Mansfield, Ohio		6.05 *E2*			7.00 *E2*								
	Middletown, Ohio		6.05 *A7*	6.60 *A7*	6.625 *A7*	7.00 *A7*								
	Niles, Warren, Ohio Sharon, Pa.	4.925 *R8, N8, S1*	6.05 *R8*	6.60 *R8*	6.625 *N8, S1*	7.00 *N8, S1, R8*	7.275 *R8*	8.975 *S1, R8*					$8.75 *R8*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Donora, Pa. Aliquippa, Pa.	4.925 *U1, J8, P6*	6.05 *U1, J8, P6*	6.60 *U1, J8*	6.625 *U1*		7.275 *U1, J8*	8.975 *U1, J8*	9.725 *U1*		6.15 *A5, J8, P6*	$10.05 *U1, J8*	$8.75 *U1, J8*	7.50 *U1, J8*
	Portsmouth, Ohio	4.925 *P7*	6.05 *P7*								6.15 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.925 *W8, W5*	6.05 *W8, F8, W5*	6.60 *W8, W5*		7.00 *W8, W5*	7.275 *W8*	8.975 *W8*				$10.05 *W8, W5*	$8.75 *W8, W5*	7.50 *W8*
	Youngstown, Ohio	4.925 *U1, Y1*	6.05 *Y1*		6.625 *Y1*		7.275 *Y1*	8.975 *Y1*			6.15 *Y1*			
WEST	Fontana, Cal.	5.675 *K1*	7.30 *K1*				8.175 *K1*	10.275 *K1*				$10.80 *K1*	$9.50 *K1*	
	Geneva, Utah	5.025 *C7*												
	Kansas City, Mo.										6.40 *S2*			
	Los Angeles, Torrance, Cal.										6.95 *B2*			
	Minnequa, Colo.										6.40 *C6*			
	San Francisco, Niles, Pittsburgh, Cal.	5.625 *C7*	7.00 *C7*	7.35 *C7*							6.95 *C7*	$10.80 *C7*	$9.50 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.925 *T2, R5*	6.05 *T2, R5*	6.60 *T2, R5*							6.15 *T2, R5*	$10.15 *T2*	$8.85 *T2*	
	Houston, Tex.										6.40 *S2*			

† Special coated mfg. terne deduct 50c from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box.

* COKES: 1.50-lb. add 25c. ELECTRO: 0.50-lb. add 25c; 0.75-lb. add 65c, 1.00-lb. add $1.00. Differential 1.00 lb. 0.25 lb. add 65c.

(Effective Dec. 20, 1957)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL PRICES

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforc ing	Cold Finished	Alloy Hot rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfrs. Bright
EAST	Bethlehem, Pa.				6.475 *B3*	8.775 *B3*	7.925 *B3*					
	Buffalo, N. Y.	5.425 *R3,B3*	5.425 *R3,B3*	7.35 *B3*	6.475 *B3,R3*	8.775 *B3,B5*	7.925 *B3*	5.10 *B3*		7.20 *B3*		7.65 *B6*
	Claymont, Del.							5.10 *C4*		7.20 *C4*	7.625 *C4*	
	Coatesville, Pa.							5.10 *L4*		7.20 *L4*	7.925 *L4*	
	Conshohocken, Pa.							5.20 *A2*	6.175 *A2*	7.20 *A2*	7.625 *A2*	
	Harrisburg, Pa.							5.10 *P2*	6.275 *P2*			
	Milton, Pa.	5.575 *M7*	5.575 *M7*									
	Hartford, Conn.			7.80 *R3*		9.075 *R3*	7.925 *B3*					
	Johnstown, Pa.	5.425 *B3*	5.425 *B3*		6.475 *B3*			5.10 *B3*		7.20 *B3*	7.625 *B3*	7.65 *B3*
	Fairless, Pa.	5.575 *U1*	5.575 *U1*		6.625 *U1*							
	Newark, N. J. Camden, N. J.			7.75 *W10* 7.75 *P10*		8.95 *W10* 8.95 *P10*						
	Bridgeport, Conn. Putnam, Conn. Willimantic, Conn.			7.85 *W10* 7.80 *J3*	6.55 *N8*	8.925 *N8*						
	Sparrows Pt., Md.		5.425 *B3*					5.10 *B3*		7.20 *B3*	7.625 *B3*	7.75 *B3*
	Palmer, Worcester, Readville, Mass. Mansfield, Mass.			7.85 *B5,C14*		9.075 *A5,B5*						7.95 *A5, B6*
	Spring City, Pa.			7.75 *K4*		8.95 *K4*						
MIDDLE WEST	Alton, Ill.	5.625 *L1*										7.85 *L1*
	Ashland,Newport,Ky.							5.10 *A7,A1*		7.20 *A1*		
	Canton, Massillon, Ohio			7.30 *R3,R2*	6.475 *R3,T5*	8.775 *R3,R2, T5*						
	Chicago, Joliet, Waukegan, Ill. Harvey, Ill.	5.425 *U1,R3, W8,N4,P14*	5.425 *U1,R3, N4,P14*	7.30 *A5, W10,W8 B5,L2,N9*	6.475 *U1,R3, W8*	8.775 *A5, W10,W8 L2,N8,B5*	7.925 *U1,W8*	5.10 *U1,A1, W8,I3*	6.175 *U1*	7.20 *U1,W8*	7.625 *U1,W8*	7.65 *A5,R3, W8,N4, K2,W7*
	Cleveland, Ohio	5.425 *R3*	5.425 *R3*	7.30 *A5,C13*		8.775 *A5, C13*	7.925 *R3*	5.20 *R3,J3*	6.175 *J3*		7.625 *R3, J3*	7.65 *A5, C13*
	Detroit, Mich.	5.525 *G3*	5.775 *G3*	7.55 *P3* 7.50 *P8,B5*	6.475 *R3* 6.575 *G3*	8.775 *R3* 8.975 *B5,P3, P8*	8.025 *G3*	5.20 *G3*		7.35 *G3*		
	Duluth, Minn.											7.65 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.425 *U1,I3, Y1*	5.425 *U1,I3, Y1*	7.30 *R3,J3*	6.475 *U1,I3, Y1*	8.775 *R3,M4*	7.925 *U1, Y1*	5.10 *U1,I3, Y1*	6.175 *J3,I3*	7.20 *U1,Y1*	7.625 *U1, Y1,I3*	7.75 *M4*
	Granite City, Ill.							5.30 *G2*				
	Kokomo, Ind.											7.75 *C9*
	Sterling, Ill.	5.525 *N4*	5.525 *N4*					5.10 *N4*				7.75 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.30 *C10*	6.475 *C10,S1*	8.775 *C10*	7.925 *S1*	5.10 *R3,S1*		7.20 *S1*	7.625 *R3, S1*	
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.425 *U1,J3*	5.425 *U1,J3*	7.30 *A5,B4, R3,J3,C11, W10,S9,C8*	6.475 *U1,J3, C11,B2*	8.775 *A5, W10,R3,S9, C11,C8*	7.925 *U1,J3*	5.10 *U1,J3*	6.175 *U1*	7.20 *U1,J3, B2*	7.625 *U1,J3, B7*	7.65 *A5, J3,P6*
	Portsmouth, Ohio											7.65 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.10 *W5*				
	Youngstown, Ohio	5.425 *U1,R3, Y1*	5.425 *U1,R3, Y1*	7.30 *A5,Y1, F2*	6.475 *U1,Y1*	8.775 *Y1,F2*	7.925 *U1,Y1*	5.10 *U1,R3, Y1*		7.20 *Y1*	7.625 *U1, R3,Y1*	7.65 *Y1*
WEST	Emeryville, Cal.	6.175 *J3*	6.175 *J3*									
	Fontana, Cal.	6.125 *K1*	6.125 *K1*		7.525 *K1*		8.625 *K1*	5.90 *K1*		8.00 *K1*	8.425 *K1*	
	Geneva, Utah							5.10 *C7*			7.625 *C7*	
	Kansas City, Mo.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*					7.90 *S2*
	Los Angeles, Torrance, Cal.	6.125 *C7,B2*	6.125 *C7,B2*	8.75 *R3,P14*	7.525 *B2*	10.65 *P14*	8.625 *B2*					8.60 *B2*
	Minnequa, Colo.	5.875 *C6*	5.875 *C6*					5.95 *C6*				7.90 *C6*
	Portland, Ore.	6.175 *O2*	6.475 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.125 *C7* 6.175 *B2*	6.125 *C7* 6.175 *B2*				8.675 *B2*					8.60 *C7,C6*
	Seattle, Wash.	6.175 *B2,N6*	6.175 *B2*				8.675 *B2*	6.00 *B2*		8.10 *B2*	8.525 *B2*	
SOUTH	Atlanta, Ga.	5.625 *A8*	5.625 *A8*									7.85 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.425 *T2,R3, C16*	5.425 *T2,R3, C16,S11*	7.90 *C16*			7.925 *T2*	5.10 *T2,R3*			7.625 *T2*	7.65 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*	5.20 *S2* 5.45 *L3*		7.30 *S2*	7.725 *S2*	7.90 *S2*

† Merchant Quality - Special Quality 35c higher (Effective Dec. 20, 1957)

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 J. & L. Steel Co., Stainless Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts pct f.o.b. mills. **Base price about $200 per net ton.**

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½ 3 In.		2 In.		2½ In.		3 In.		3½ 4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Youngstown *R3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fontana *K1*	+8.25	+23.5	+5.25	+19.5	+1.75	+15.00	0.75	+14.25	1.25	+13.25	1.75	+12.75	3.25	+13.00								
Pittsburgh *J3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Alton, Ill. *L1*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Sharon *M3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fairless *N2*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Pittsburgh *N1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Wheeling *W5*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Wheatland *W4*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Youngstown *Y1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Indiana Harbor *Y1*	4.25	+11.0	7.25	+7.0	10.75	+2.50	13.25	+1.75	13.25	+0.75	14.25	+0.25	15.75	+1.00								
Lorain *N2*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Youngstown *R3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Fairless *N2*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Fontana *K1*	+3.75		0.25		3.25		3.75		4.25		4.75		5.25									
Pittsburgh *J3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Alton, Ill. *L1*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Sharon *M3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Pittsburgh *N1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Wheeling *W5*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Wheatland *W4*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Youngstown *Y1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Indiana Harbor *Y1*	8.75	+5.0	12.75	+1.0	15.75	3.50	16.25	2.25	16.75	3.25	17.25	3.75	17.75	2.50								
Lorain *N2*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50

Threads only, buttweld and seamless 2½ pt. higher discount. **Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.**
Galvanized discounts based on zinc price range of over 9c to 11c per lb. East St. Louis. For each 2c change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1 pt.; 2½ and 3-in., 1 pt., e.z. zinc price range of over 13c to 15c would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7c to 9c would increase discounts. East St. Louis zinc price now 10c per lb.

(Effective Dec. 20, 1957)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.795	T-1
18	4	1	—	5	2.50	T-4
18	4	2	—	—	1.96	T-2
12	4	1.5	8	—	1.155	M-1
6	4	2	6	—	1.145	M-2
6	4	2	5	—	1.30	M-2

Higher-carbon chromium ..... .925 D-5, D-7
Oil hardened manganese ..... .475 O-2
Special carbon ..... .26 W-1
Extra carbon ..... .26 W-1
Regular carbon ..... .205 W-1

Warehouse prices on and east of Mississippi river 1c per lb higher. West of Mississippi, 6c higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

Stainless Type	Cladding	Plate (*A5, J2, L4, C4*) 10 pct	15 pct	20 pct	Sheet (*J2*) 20 pct
	302				37.50
	304	37.95	42.25	46.70	40.00
	316	44.40	49.50	54.50	58.75
	321	40.05	44.60	49.30	47.25
	347	42.40	47.55	52.80	57.00
	405	29.85	33.35	36.85	
	410	29.55	33.10	36.70	
	430	29.80	33.55	37.25	

CR Strip (S80) Copper, 10 pct, 2 sides, 40.25; 1 side, 33.95.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.525	6.50	6.975				
Cleveland *R5*							14.75
So. Chicago *R5*				9.75			
Ensley *T2*	5.525	6.50					
Fairfield *T2*		6.50		9.75		6.60	
Gary *U1*	5.525					6.60	
Huntington *C6*		6.50					
Ind. Harbor *I5*	5.525		6.975	9.75		6.60	
Ind. Harbor *Y1*				9.75			
Johnstown *B3*		6.50					
Joliet *U1*			6.975				
Kansas City *S2*				9.75			14.75
Lackawanna *B5*	5.525	6.50	6.975			6.60	
Lebanon *B5*			6.975		14.50		14.75
Minnequa *C6*	5.525	7.00	6.975	9.75		6.60	14.75
Pittsburg *P5*							14.75
Pittsburgh *J5*				9.75			
Seattle *B2*				10.25		6.75	15.75
Steelton *B5*	5.525		6.975			6.60	
Struthers *Y1*				9.75			
Torrance *C7*						6.75	
Williamsport *S5*		6.50					
Youngstown *R5*				9.75			

COKE

	Net Ton
Furnace, beehive (f.o.b.) Connellsville, Pa.	$15.00 to $15.75
Foundry, beehive (f.o.b.)	$17.50 to $19.00
Foundry oven coke	
Buffalo, del'd	$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville Is., Pa.	29.25

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1957 season. Freight charges for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced Coiled or Cut Length) Semi-Processed	Fully Processed
Field		9.625	
Armature	11.10	10.85	11.35
Elect.	11.80	11.55	12.05
Special Motor		12.10	
Motor	12.90	12.65	13.15
Dynamo	13.95	13.70	14.20
Trans. 72	15.00	14.75	15.25
Trans. 65	15.55		
		Grain Oriented	
Trans. 58	16.05	Trans. 66	20.20
Trans. 52	17.10	Trans. 80	19.20
		Trans. 73	19.70

Producing points: Beech Bottom (*W5*); Brackenridge (*A5*); Granite City (*G2*); Indiana Harbor (*I5*); Mansfield (*E2*); Newport, Ky. (*A5*); Niles, O. (*N5*); Vandergrift (*U1*); Warren, O. (*R5*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb f.o.b. plant, threaded, with nipples, unbaked.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	26.00	40	100, 110	10.70
20	72	25.25	35	110	10.70
18	72	25.75	30	110	10.85
14	72	25.75	24	72 to 84	11.25
12	72	26.25	20	90	11.00
10	60	28.00	17	72	11.40
10	48	28.50	14	72	11.85
7	60	28.25	12	60	12.95
6	60	31.50	10	60	13.00
4	40	35.00	8	60	13.30
3	40	37.00			
2½	30	39.25			
2	24	60.75			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$135.00
No. 1 Ohio	120.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	120.00
No. 2 Ohio	103.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00)	21.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$150.00
Childs, Hays, Pa.	155.00
Chicago District	160.00
Western Utah	175.00
California	180.00
Super Duty: Hays, Pa., Athens, Tex., Windham, Warren Co., Morrisville	157.00-160.00
Silica cement, net ton, bulk, Latrobe	28.50
Silica cement, net ton, bulk, Chicago	25.50
Silica cement, net ton, bulk, Ensley, Ala.	26.50
Silica cement, net ton, bulk, Mt. Union	24.50
Silica cement, net ton, bulk, Utah and Calif.	37.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$105.00
Standard chemically bonded, Curtner, Calif.	115.00
Burned, Balt.	99.00

Magnesite Brick

Standard Baltimore	$131.00
Chemically bonded, Baltimore	116.00

Grain Magnesite

St. ⅜ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk	$75.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
In sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$16.75
Midwest	17.80
Missouri Valley	15.00

(Effective Dec. 20, 1957)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Merch. Wire Annl'd Col	Merch. Wire Galv. ¢ lb.	Merch. Wire Galv. ¢ lb.
Alabama City *R5*	173	187		212	193	8.65	9.20
Aliquippa *J5***	173	190			190	8.65	9.325
Atlanta *A8***	175	192		214	198	8.75	9.425
Bartonsville *K2***	175	192	178	214	198	8.75	9.425**
Buffalo *R6*						8.65	8.95*
Chicago *N4****	173	190	172	212	196	8.65	9.325
Cleveland *A6*							
Cleveland *A5*						8.65	
Crawf'dav. *M4****	175	192		214	198	8.75	9.425
Donora, Pa. *A5*	173	187		212	193	8.65	9.20
Duluth *A5*	173	187		212	193	8.65	9.20
Fairfield, Ala. *T2*	173	187		212	193	8.65	9.20
Galveston *D4*	9.10‡						
Houston *S2*	178	192		217	198	8.90	9.45
Jacksonville *M4*	184-1	197		219	203	9.00	9.675
Johnstown *B5***	173	190	172		196	8.65	9.325**
Joliet, Ill. *A5*	173	187		212	193	8.65	9.20
Kokomo *C9*	175	189		214	195	8.75	9.30
L. Angeles *B2****						9.60	10.275
Kansas City *S2**	178	192		217	198	8.90	9.45
Minnequa *C6*	178	192	177	217	198	8.90	9.45
Monessen *P6*					193	8.65	9.20
Palmer, Mass. *W6*						8.95	9.50*
Pittsburg, Cal. *C7*	192	210			213	9.60	10.15
Rankin, Pa. *A5*	173	187			193	8.65	9.20
So. Chicago *R5*	173	187			193	8.65	9.20
S. San Fran. *C6*‡				236		9.60	10.15‡
Sparrows Pt. *B5***‡	175			214	198	8.75	9.425
Sterling, Ill. *N4***‡	175	192	172	214	198	8.75	9.425
Struthers, O. *Y1*‡						8.65	9.30
Worcester *A5*‡	179					8.95	9.50
Williamsport *S5*‡							

* Zinc less than 10¢.
** 11-12¢ zinc.
*** 10¢ zinc.
‡ Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.10	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*		10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70		
Detroit *D1*	9.05	10.50	12.70	15.70	
Detroit *D2*	9.05	10.50	12.70		
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60		
Franklin Park, Ill. *T8*	9.05	10.25	12.45	15.45	18.40
Harrison, N. J. *C11*			12.90	16.10	19.30
Indianapolis *J5*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Pittsburgh *S7*	8.95	10.40	12.60	15.60	18.55
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*		10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *J5*	8.95	10.40	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
National Tube	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
Pittsburgh Steel	2	13	36.34	42.56	
	2½	12	48.94	57.31	
	3	12	56.51	66.18	
	3½	11	65.97	77.25	
	4	10	87.61	102.59	

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
½" and smaller x 6" and shorter	49	54	56	57
5/8" thru 1" x longer than 6"	35	40	43	45
Rolled thread carriage bolts ½" & smaller x 6" and shorter	49	54	56	57
Lag, all diam. x 6" & shorter	49	54	56	57
Lag, all diam. longer than 6 in.	39	44½	47	48½
Plow bolts, ½" and smaller x 6" and shorter	49	54	56	57

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	60½
⅞ in. to 1 in. inclusive	55½
1⅛ in. to 1½ in. inclusive	58½
1⅝ in. and larger	53½
C. P. Hex, reg. & hvy.	
¾ in. and smaller	60½
⅞ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
Hot Galv. Hex Nuts (All Types)	
¾ in. and smaller	46½
Semi-finished Hex Nuts	
⅝ in. or smaller	60½
¾ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½

(Add 25 pct for broken case or keg quantities)

Finished

⅞ in. and smaller 63

Rivets

Base per 100 lb

½ in. and larger $12.25

Pct. Off List

7/16 in. and smaller 19

Cap Screws

	Discount (Packages) *Full Finished H. C. Heat Treat*	
New std. hex head, packaged		
⅝" diam. and smaller x 6" and shorter	40	26
¾", ⅞", and 1" diam. x 6" and shorter	22	3
⅝" diam. and smaller x longer than 6"	8	+13
¾", ⅞", and 1" diam. x longer than 6"	+ 6	+32
	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	58	49
¾" through 1" dia. x 6" and shorter	45	33

Minimum quantity—¼" through ⅜" diam., 15,000 pieces; 1/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

Plain Finish	Discount Mach. Screws	Stove Bolts
Cartons	19	32
Bulk — *Quantity*		
To ¼" diam. incl. — 25,000-200,000	9	54
5/16 to ½" diam. incl. — 25,000-200,000	9	54
All diam. over 3" long — 5,000-100,000	—	54

Machine Screws & Stove Bolt Nuts

	Discount Hex	Square
In Cartons	16	19
Quantity		
In Bulk		
⅝" diam. & smaller — 15,000-100,000	7	9

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.7
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	43.50
Electrodeposited	33.25
Brass, 80-20, ball anodes, 2000 lb or more	44.00
Zinc, ball anodes, 2000 lb lots (for elliptical add 1¢ per lb)	16.50
Nickel, 99 pct plus, rolled carbon, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.70
Tin, ball anodes and elliptical $1.13 per lb.	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	74.70
Copper sulphate, 100 lb bags, per cwt.	24.35
Nickel salts, single, 100 lb bags	40.50
Nickel chloride, freight allowed, 200 lb	48.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums (Philadelphia price 23.10)	23.05
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum N. Y.	48.00
Chromic acid, flake type, 10,000 lb or more	31.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots for minus 100 mesh

Swedish sponge iron, del. East of Miss. River, ocean bags, 24,000 lb. and over	10.5¢
F.O.B. Riverton or Camden, New Jersey, freight allowed west of Miss. River	9.5¢
Domestic sponge iron, 98+% Fe, 23,000 lb and over del'd East of Miss. River	10.5¢
F.O.B. Riverton, New Jersey, West of Miss. River	9.5¢
Canadian sponge iron, del'd in East, carloads	12.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	27.0¢
Carbonyl iron size 3 to 20 micron, 98% 99.8+% Fe	88.0¢ to $2.85
Aluminum, freight allowed	38.00¢
Brass, 10 ton lots	31.1¢ to 47.1¢
Copper, electrolytic	41.50¢
Copper, reduced	40.3¢ to 48.8¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99.85% min. Fe .03 max. Del'd	$5.00
Lead	21.50¢ lb, f.o.b. plant
Manganese f.o.b. Extron, Pa.	46.0¢
Molybdenum, 99%	$3.60 to $3.95
Nickel, chemically precipitated	$1.05
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed #80	$1.13
Silicon	43.50¢
Solder powder	13¢ plus met. value
Stainless steel, 302	$1.02
Stainless steel, 316	$1.30
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh) $3.75 (nominal)	
Zinc, 5000 lb & over	17.5¢ to 30.7¢

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery† Charge	Sheets: Hot-Rolled 18 ga. & hvr.	Sheets: Cold-Rolled 15 gage	Sheets: Galvanized 10 gage††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.64	8.97	9.05	9.01	10.68	.....	.....	.....	.....
Baltimore	$.10	8.38	8.98	9.71	8.86	8.76	9.29	9.16	11.41*	16.18	15.18	19.73	18.98
Birmingham	.15	8.18	9.45	10.15	8.23	8.56	8.64	8.60	10.57	.....	.....	.....	.....
Boston	.10	9.48	10.54	11.55	9.52	9.82	9.73	9.83	13.00	15.79	15.38	19.89	19.18
Buffalo	.15	8.40	9.15	11.22	8.65	9.05	9.05	8.95	11.05*	16.34	15.15	19.01	18.95
Chicago	.15	8.35	9.60	10.15	8.38	8.71	8.79	8.75	8.95	15.80	14.80	19.35	18.60
Cincinnati	.15	8.49	9.65	10.20	8.69	9.08	9.33	9.07	9.46	15.61	15.11	18.96	18.91
Cleveland	.15	8.33	9.60	10.10	8.48	8.94	9.16	8.84	10.95*	15.89	14.89	19.44	18.96
Denver	.20	9.70	11.30	12.49	9.80	9.70	9.80	9.98	10.65	.....	.....	.....	17.60
Detroit	.15	8.58	9.85	10.50	8.73	9.06	9.33	9.05	9.30	15.46	15.06	18.81	18.86
Houston	.....	8.45	9.75	.....	8.60	9.05	8.60	8.55	11.10	16.20	.....	19.30	19.05
Kansas City	.20	9.02	10.27	10.07	9.05	9.38	9.46	9.42	9.87	20.02	15.47	20.02	19.27
Los Angeles	.10	7.85**	10.85	11.75	7.90	7.90	7.95	7.90	13.35*	17.05	16.10	21.05	20.35
Memphis	.15	8.02	9.22	.....	8.12	8.35	8.39	8.25	9.85	.....	.....	.....	.....
Milwaukee	.15	8.48	9.73	10.28	8.51	8.84	9.00	8.88	9.18	15.43	14.93	18.78	18.73
New York	.10	8.97	10.23	10.66	9.41	9.53	9.45	9.67	12.86*	15.02	15.19	18.42	18.99
Norfolk	.20	8.00	.....	.....	8.40	8.35	8.70	8.45	10.70	.....	.....	.....	.....
Philadelphia	.10	8.10	9.00	9.97	8.79	8.87	8.60	8.75	11.61*	15.61	15.11	18.96	18.91
Pittsburgh	.15	8.33	9.60	10.50	8.48	8.71	8.79	8.75	10.95*	15.80	14.80	19.35	18.60
Portland	.....	8.50	11.20	11.55	9.05	8.30‡	8.65	8.65	14.50	18.50	16.10	20.75	20.25
San Francisco	.10	9.45	10.85	11.10	9.55	9.70	9.60	9.80	13.10	17.05	16.10	21.05	20.35
Seattle	.....	9.95	11.15	12.00	10.00	9.70	9.80	10.80	14.05	16.55	16.35	20.65	20.15
Spokane	.15	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.20	.....	17.35	21.55	21.05
St. Louis	.15	8.69	9.94	10.51	8.74	9.08	9.25	9.12	9.56	15.66	15.16	19.01	18.96
St. Paul	.15	8.94	10.19	10.76	8.99	9.45	9.53	9.37	9.81	.....	15.26	.....	19.06

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** All sizes except 18 and 16 gage. †† 10¢ zinc. ‡ Deduct for country delivery. † 3/16 in. to ½ in. * C1018—1 in. rounds.

(Effective Dec. 20, 1957)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	
Birmingham *R3*	62.00	62.50*			
Birmingham *W9*	62.00	62.50*	66.50		
Birmingham *U4*	62.00	62.50*	66.50		
Buffalo *R3*	66.00	66.50	67.00	67.50	
Buffalo *H1*	66.00	66.50	67.00	67.50	
Buffalo *W6*	66.00	66.50	67.00	67.50	
Chester *P2*	66.50	67.00	67.50		
Chicago *I4*	66.00	66.50	66.50	67.00	
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50		
Fontana *K1*	75.00	75.50			
Geneva, Utah *C7*	66.00	66.50			
Granite City *G2*	67.90	68.40	68.90		
Hubbard *Y1*			66.50		
Ironton, Utah *C7*	66.00	66.50			
Midland *C11*	66.00				
Minnequa *C6*	68.00	68.50	69.00		
Monessen *P6*	66.00				
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *I1*		66.50	67.00	67.50	
Sharpsville *S1*	66.00	66.50	66.50	67.00	
So. Chicago *R3*	66.00	66.50	66.50		
So. Chicago *W8*	66.00		66.50	67.00	
Swedeland *A2*	68.00	68.50	69.00	69.50	
Toledo *I4*	66.00	66.50	66.50	67.00	
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	74.00
Youngstown *Y1*			66.50	67.00	

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct); 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31 0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01 15.50), $101.00; Keokuk (14.01 14.50), $103.50; (15.51 16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $64.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	27.00	28.00	31.50	32.00	33.25	49.50	40.00	46.50	—	21.50	—	21.75
Billets, forging	—	36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	32.00	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	37.75	33.75	34.25	34.25
Plates	44.25	45.00	46.25	47.25	50.00	50.75	76.75	59.75	69.75	40.25	35.00	36.75	36.00
Sheets	48.50	49.25	51.25	52.00	—	55.50	81.50	65.50	79.25	48.25	40.25	—	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	—	55.50	81.50	65.50	79.25	48.25	40.25	—	40.75
Wire CF; Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.25	52.50 52.75	61.50	35.75	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J2*, Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*, Washington, Pa., *W2*; W. Leechburg, Pa., *A5*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Harrison, N. J., *D3*; Youngstown, *J3*, Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (plus further conversion extras); *W1*; New Bedford, Mass. (.25¢ per lb higher), *R6*; Gary, *U1* (.25¢ per lb higher).

Bar: Baltimore, *A7*, S. Duquesne, Pa., *U1*; Munhall, Pa., *U1*, Reading, Pa., *C2*, Titusville, Pa., *U2*, Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A5*; Massillon, O., *R5*, S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A5*; Waukegan, *A5*; Canton, O., *T5*, *R5*; Ft. Wayne, *I4*; Detroit, *R5*; Gary, *U1*.

Wire: Waukegan, *A5*; Massillon, O., *R5*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A5*; Monessen *P1*; Syracuse, *C11*; Bridgeville, *U2*.
Structurals: Baltimore, *A7*; Massillon, O., *R5*; Chicago, Ill., *J4*; Watervliet, N. Y., *A5*; Syracuse *C11*; S. Chicago, *U1*.

Plates: Brackenridge, Pa., *A5*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown; *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R5*; Coatesville, Pa., *C15*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R5*; Watervliet, *A5*; Pittsburgh, Chicago, *U1*, Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*.

(Effective Dec. 20, 1957)

FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd, 67-71% Cr, .30-1.00% max. Si.

0.02% C	41.00	0.50% C	38.00
0.05% C	39.00	1.00% C	37.75
0.10% C	38.50	1.50% C	37.50
0.20% C	38.25	2.00% C	37.25

4.00-4.50% C, 60-70% Cr, 1-2% Si.. 28.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 27.50
0.025% C (Simplex) 36.75
8.00% max C, 50-55% Cr, 3-6% max Si 25.00
8.50% max C, 50-55% Cr, 3% max Si 25.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.31
0.50% max. C	1.31
9 to 11% C, 88-91% Cr, 0.75% Fe...	1.40

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	$1.29
Ton lots	1.31
Less ton lots	1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.

Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads	27.50	14.20
Ton lots	32.75	15.65
Less ton lots	34.35	17.30

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Ca, 60-65% Si, 3.00 max. Fe.

Carloads	25.65
Ton lots	27.95
Less ton lots	29.45

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	24.25
Ton lots	26.15
Less ton lots	27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	21.15
Less ton lots	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	17.20
Ton lots	18.70
Less ton lots	19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.50
Ton lots to carload packed	19.65
Less ton lots	20.90

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25

Add or substract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	14.80
Ton lots packed	17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	34.00
Ton lots	36.00
250 to 1999 lb	38.00
Premium for Hydrogen - removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk	12.80
Ton lots, packed	14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	15.10
Ton lots, packed, pallets	16.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots, packed	Carloads, packed
96.75% Si, 1.25% Fe,.	24.20	22.90
98% Si, 0.75% Fe	24.95	23.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk	7.70
Ton lots, packed	10.50

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si	13.00	75% Si	16.40
65% Si	15.25	85% Si	18.10
		90% Si	19.50

Ferrovanadium

50-55% V delivered, per pound, contained V, carloads, packed.

Openhearth	3.20
Crucible	3.30
High speed steel (Primos)	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.95	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

(Effective Dec. 20, 1957)

Alsifer,

20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.65¢
Ton lots	11.80¢

Calcium molybdate,

43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.28

Ferrocolumbium,

50-50%, 2 in. x D, delivered per pound contained Cb.

Ton lots	$4.90
Less ton lots	4.95

Ferro-tantalum-columbium,

20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Sb plus Ta $4.25

Ferromolybdenum,

55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.68

Ferrophosphorus,

electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload $110.00

Ferrotitanium,

40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium,

25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium,

15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $240.00

Ferrotungsten,

¼ x down packed, per pounds contained W, ton lots delivered ..... $2.60 (nominal)

Molybdic oxide,

briquets per lb contained Mo, f.o.b. Langeloth, Pa. $1.41
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.38

Simanal,

20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide,

86-89% V_2O_5 per pound contained V_2O_5 .. $1.38

Zirconium,

per lb of alloy

35-40% f.o.b. freight allowed, carloads, packed	27.25¢
12-15%, del'd lump, bulk-carloads	9.25¢

Boron Agents

Borosil,

per lb of alloy del. f.o.b. Philo, Ohio, freight allowed. B 3-4%, Si 40-45%, per lb contained B
2000 lb carload $5.50

Bortram,

f.o.b. Niagara Falls.

Ton lots per pound	45¢
Less ton lots, per pound	50¢

Corbortam,

Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 14.00¢

Ferroboron,

17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots.. $1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	.85
14 to 19%	1.20
19% min. B	1.50

Grainal,

f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over

No. 1	$1.05
No. 79	50¢

Manganese-Boron,

75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots	$1.46
Less ton lots	1.57

Nickel-Boron,

15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

New York Sales Sag In Last Quarter

Used machinery dealers there had a fair year, but the last three months didn't help.

First quarter prospects are brighter with aircraft firms in the area getting a little more active.

▪ New York area used machinery dealers are not sorry to wind up 1957. Good business earlier in the year will probably enable most to make a respectable showing for '57, but fourth quarter business is bluntly described by many as "lousy."

Tight money, slipping metalworking operations and some dire predictions, especially from Wall Street, have depressed the market ever since October. Biggest blow has been expiration and cancellation of contracts of neighboring aircraft plants, particularly on Long Island. Subcontracting work for these plants has traditionally been a prime business prop for many metalworking shops in the area.

Local makers of consumer goods, even though marketing nationally, have always looked for a good share of sales right at their own front door. Aircraft plant layoffs have repercussions throughout this trading area at all levels.

Aircraft Brightens — The first quarter looks brighter. One of the area's largest planemakers now has a full year's work slated, and more contracts for other firms are expected to come through soon. Defense spending of all types seems sure to rise in the next few months. Tool dealers are sure that these hypos to local economy will bring them considerably better business. In the meantime, they are waiting.

Some dealers report that they are having a mild flurry of sale closings as customers finally order machines they have been considering for some months. It's assumed that the buyers find they have the cash available as book-closing time draws near and final cash balances are more surely predictable. There is no real volume of these orders, and they should not be considered an upward trend—at least not yet.

No Work, No Buying—The trade emphasizes that customers are buying when their own business justifies. Less talk is now heard about discount rates as it's seen that business volume has slipped more in fourth quarter than had been realized. Prospects are still interested in information about available tools, but firm commitments are very hard to get unless the buyer has a job for the tool right now.

Auction sales have held up fairly well, reflecting willingness to buy by those companies who do have orders in hand.

Who's Buying?—While the New York market remains dull, some industries are helping sales in the Midwest. Chicago dealers report television, electronics, and small screw machine parts people are a sturdy market for sheet metalworking tools and other light equipment. In addition, many heavy machine tool orders are coming from manufacturers who are pulling jobbing work into their own home plants. Because of this they have to beef up machining departments to meet the increased load.

CONSIDER GOOD USED EQUIPMENT FIRST

BENDING ROLLS
10' x 10" Ga. Bertsch Initial Type
10' x ½" King Pyramid Type
10' x ½" Bertsch Initial Type
18' x 1" Niles Pyramid Type

BRAKE—PRESS TYPE
10' x ¼" & 12' x ⅜" Hydraulic—NEW

CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton P&H	56' Span 220/3/60
5 ton Cleveland	60' Span 115 Volt D.C.
5 ton Shepard Niles	70' Span 230 Volt D.C.
5 ton P&H	55' Span 220/3/60
10 ton Shepard Niles	88' Span 440/3/60
10 ton Shaw	48' Span 230 Volt D.C.
10 ton Shaw	120' Span 230 Volt D.C.
15 ton Shepard Niles	52' Span 230 Volt D.C.
15 ton Niles	75' Span 230/3/60
20 ton Shaw	28' Span 230 Volt D.C.
120 ton Shepard Niles	77' Span 220/3/60

DRAW BENCHES
8,000# Waterbury Farrel Single Draw 20 Ft. Length of Draw
10,000# Aetna Standard Single Draw 11 Ft. Length of Draw

FORGING MACHINES
1" to 3" Acme, Ajax, National

FURNACE—MELTING
15 ton Heroult Top Charge, 12' Shell Complete with Transformers

HAMMERS—BOARD DROP—STEAM DROP—STEAM FORGING
800 lb. to 20,000 lb. incl.

HEADERS
#2500 Manville Solid Die Single Stroke
#11 Waterbury Farrel DSOD Caps. ⅝" x 6"

LEVELLERS—ROLLER
18" Torrington, 15 Rolls 2⅝" dia.
37" Torrington, 19 Rolls 1 31/32" dia.
66" Aetna 17 Rolls 4⅜" dia.

PLANERS
36" x 36" x 10' Cincinnati
48" x 48" x 16' Niles-Bement-Pond
72" x 72" x 36' Detrick & Harvey Four Head

PRESSES—HYDRAULIC
400 ton HPM Fastraverse, Bed 36" x 36"
1500 ton Birdsboro 45" Stroke, Bed 49" x 48"
2500 ton Mesta Steam Hydr. Forging Press
2000 ton Niles 18" Stroke Bed Area 54" x 55"
1400 ton Baldwin-Lima-Hamilton Hydr. Forging Press

PRESSES—STRAIGHT SIDE
180 ton Hamilton #845, 12" Str. 85½" Bet. Ups
200 ton Clearing 12200-42 Stroke 20", Bed 44"x38"
250 ton Niles #88, 12" Str. Bed 28" x 29"
250 ton Niles #2-12" Str. Bedtr. 33" x 39"

PUNCH & SHEAR COMBINATIONS
Cleveland Style EF, Arch Jaw Capy. 1¼" x 1"
Cleveland Style G Single End, 60" Throat
Cleveland Style W, 60" Throat, Architectural Jaw
2" Kaiser, 72" Throat, With Thomas Duplicator

ROLLING MILLS
6" x 9" Torrington Wire Flattening Mill Line
8" x 16" Sendzimir Single Stand Two High
10" x 14" Single Stand Two High
14" x 36" Single Stand Two High
12" x 42" Single Stand Two High
12" x 36" Single Stand Two High
30" x 36" Single Stand Two High
30" x 36" Single Stand Two High

ROLLS—FORMING
14 stand Yoder, 2½" shaft dia. 30" bet. housings

ROLLS—PLATE STRAIGHTENING
22" Bertsch Seven Rolls 9" Dia.
22" Yoder Nine Rolls 9" Dia. Motor Driven

SHEAR—ALLIGATOR
No. 4 Mesta RH L.K. Capacity 2" x 12"

SHEARS—GATE
6' x 1" Hilles & Jones #6
10' x ¾" Niagara Model 1212, NEW 1951

SHEAR LINES
36" x .020 Ga. Haliden Shear Line
42" Bliss 13-C-0 Shear, Capacity .125" Max. With Hitting & Runout Tables
56" x ⅜" Heavy Duty Shear Line
60" x 7 Ga. Shear Line
36" x 14 Ga. Cleveland Shear Line

SHEARS—SQUARING
6' x 10 Ga. Niagara No. 672
10' x ¾" Cincinnati #1810
10' x ¾" Cincinnati #2510

SHEAR—ANGLE
6" x 6" x ⅝" Hilles & Jones

SLITTER
36" Paxson Slitting Line

STRAIGHTENERS
No. 3 Medart 3 Roll, Capacity to 1½" Tubing
Torrington 12 Roll, Cap. 1½" Hex. Sq. Etc.
No. 0A Medart 7 Roll, Capacity ⅝" Rd. Bars
No. 0 Medart 7 Roll, Capacity to 1¼" dia. Bars

SWAGING MACHINE
#6½ A Fenn, Capacity 3⅜" Tube, 1¼" Solid, 18" Die Length Hydraulic Feed, LATE

TUMBLING MILL
Ratcliffe Centrifugal Tumbling Mill, Capacity Approx. 100 cu. ft. of work per hr. LATE

WELDING POSITIONER
Pandjiris Welding Positioner 22" x 20", Hoist Stroke 20'10" Boom Stroke 20'6" LATE

WIRE MACHINERY
New England Butt Co. 4 Bobbin Planetary cablers Model N-30A, Robbin Size 16" x 19¼"
Vaughn Wire Drawing Machine, 4 Blocks 22" Dia. Complete elect. equip. for each block

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• Manufacturing

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Telephone COrtlandt 7-3437

Equipment •

Confidential Certified Appraisals
Liquidations—Bona Fide Auction Sales Arranged

Consulting Engineering Service
Surplus Mfg. Equipment Inventories Purchased

2000# Chambersburg Pneumatic Forging Hammer, Late Type, Serial 20CH392L7.
2500 lb. Model E Chambersburg Steam Drop Hammer, New 1944
6½" Square Alligator Shear; clutch operated; United Engineering & Foundry.
WHEELABRATOR, American; 36" x 42", skip loader hoist; dust arrester.
Lindberg Endothermic Atmospheric Generator; 750 CFH, output 2200 deg. F.
Bliss Trimming Presses Tie Rod Construction Side Shears Capacities 113, 150, 190 tons
3—2-ton Denison Auto. Hopper Feed & Index Table Hydr. Multipress
6' x 10 ga. Cincinnati Squaring Shear
¼" x 8' Pexto Gate Shear; 20" throat
4" National High Duty Upsetting & Forging Machine, air clutch, also one with regular clutch, also 1" 2", 3"
Williams White Bulldozers from 5-ton to 300-ton
Landis Landmaco and other Landis Threading Machines
Single & Double End Punches
No. 3 Motch & Merryweather Saw, with Saw Grinder
No. 3 Waterbury Farrel Progressive Header. Cap. ½"; 4 stations and 1 Cutoff

BOLT, NUT AND RIVET MACHINERY, COLD HEADERS, THREAD ROLLERS, THREADING MACHINES, TAPPERS, COLD BOLT TRIMMERS, SLOTTERS, HOT HEADERS AND TRIMMERS, COLD AND HOT PUNCH NUT MACHINES.

DONAHUE STEEL PRODUCTS CO.

1919 W. 74th Street, Chicago 36, Ill.

REBUILT — GUARANTEED ELECTRICAL EQUIPMENT

MOTOR GENERATOR SETS

Qu.	KW	Make	RPM	D.C. Volts	A.C. Volts
5	150	Al.Ch.	514	360/700	13800/6900/4160
1	1500	G.E.	514	258	2300/4000
1	1450	Whse.	900	600	2300/4000
2	1250	Al.Ch.	720	600	2300/4000
1	850	G.E.	720	240/350	2300
1	725	Whse.	900	600	2300/4000
1	500	Cr Wh.	720	600	2300/440
1	500	G.E.	900	250	2300
4	300	Whse.	1200	125/250	2300
1	300	Al.Ch.	1200	250/300	2300
	(3-unit)				
2	200	Whse.	1200	125/250	2300/440
2	150	Rel.	1200	125	2300/440
1	150	Whse.	1200	125/250	2300/440
1	150	G.E.	1200	250	4600/2300
1	100	Whse.	720	125/250	220
1	75	Whse.	1200	125/250	2300

2—400 KW. G.E. sealed Ignitron Mercury Arc Rectifiers complete with AC and DC switchgear and 475 KVA Pyranel Transf. 2400 V. 3 ph., 60 cycle.

DIRECT CURRENT MOTORS
230-Volt

Qu.	H.P.	Make	Type	R.P.M.
1**	1500	Whse.	Encl.	600
1**	700	Whse.	Encl.	143
1	700	Whse.	Encl.	360/700
2**	600	Whse.	Mill	200/1600
2	600	Whse.	QM	110/220
1	400	G.E.	MPC	450
1	300	Whse.	Mill	300/900
1	300	Whse.	Mill	300
1	275	Whse.	QM	425/850
1	200/250	El.Dy.	Ped. Brg.	300/1200
1	180	G.E.	MPC	300
1	175	G.E.	CD-175-A	850/1025
1	125	Whse.	SK-184	575/850
1	80	Rel.	651-T	575/1150
1	80	El.Dy.	25-S	525/1050
1	60/75	Whse.	SK-151	250/1000
1	50	Whse.	SK	500/1500
1	50	Whse.	SK-141	250/1000
2	30/40	Whse.	SK-143	500/1500
1	35	Whse.	SK	250/1000
1	32½	Whse.	SK-150	300/1200
1	25	Whse.	SK-121	200/1200
2	15	Whse.	SK-93	575/1725
3	5/7½	Rel.	T.E.F.C.	337/1350

** 600 volts
All others—230 volts

T. B. MAC CABE COMPANY

4302 Clarissa St., Philadelphia 40, Penna.

Cable Address "Macsteel" Philadelphia, Pa.
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USED MACHINE TOOLS OF QUALITY

200 KVA Federal No. 70 flash butt welder
50 KW Sciaky Dynatrol automatic cycle press type spot welder
7½" National high duty air clutch upsetting, forging
4" National high duty upsetting, forging, airclutch, new 1944
4" National high duty upsetting, forging, 4 point clutch with air operator
3"-3½" Ajax upsetter steel frame
3" National high duty upsetting, forging, air clutch (2)
1½" National all steel upsetting, forging, hard ways
1" National high duty upsetting, forging, new 1947, air clutch
Economy type R automatic threading, pointing machines (2)
Economy type KK automatic bolt head shaving, pointing machine
38" throat New Doty Mfg. No. 17F single geared single end punching and shearing, MD
36" Rockford openside universal shaper planer, mechanical, motor drive
10½" x 10½" No. 3 Motch & Merryweather circular cold metal saw, MD
Cleveland cradle type uncoilers, 50"-72" wide, 52" dia., hydraulic
750 ton No. 3 National Maxipress, all steel, forging, air clutch

Write for latest list No. 207

MILES MACHINERY CO.

PHONE SAGINAW PL 2-3105
2041 E. GENESEE AVE. SAGINAW, MICH.

Leveller 17 Roll Backed Up 3" by 30" Fessler.
Leveller 5 Roll 5¼" by 30" Hvy. Duty Fessler.
Grading Mill 6" by 5" Standard, 2 Hi Roller Bg.
Diesel Generator 80 KW 250 V DC Cummins GE.
Compressor 4,000#, 150 HP Syn Mtr. Torpedo Charger MG Set GE 250 KW 250 V DC 720 RPM 375 HP 220 v.
Tube Bender W&W 1¼ Universal Hyd. 15HP 440 v.

F. H. CRAWFORD & COMPANY
30 Church Street New York 7, N. Y.

BENNETT MACHINERY CO.

800 TON MILES WHEEL PRESSES
(2) Late Type 800 ton Wheel Presses, 96" between bars; max. dist. ram and resistance head 9'3" wgt. each 65,000 lbs.
(1) 32" Ohio Dreadnaught Shaper, M. D.

375 Allwood Rd., Clifton, New Jersey
Phone: PRescott 9-8996 N. Y. Phone: LOngacre 3-1227

6' x 1" Hilles & Jones Gate Shear, 12" Gap, Motor Driven.
8' x ¼" Niagara Shallow Gap Power Squaring Shear, M.D.

FALK MACHINERY COMPANY

16 Ward St. Baker 5887 Rochester 5, N. Y.

1—28" x 40" HOT STRIP MILL, 2-high, reversing with 2500 HP D.C. motor, etc.
2—28" 3-HIGH ROLL STANDS with inlet, outlet and intermediate tables. Will produce 4" sq. billets from 8" sq. blooms in 6 passes. Includes bloom shear.
1—28" REVERSING BREAKDOWN MILL.
1—25" & 42" x 60" HOT STRIP MILL, 4-high.
1—28" PINION STAND, 2-high, modern design.
1—16" x 22" COLD MILL, 2-high.
1—14" x 18" COLD MILL, 2-high.
1—10" x 14" COLD MILL, 2-high.
1—CLUSTER MILL, 4-stands, each with 2 work rolls 3¼" x 7" and 4 back-up rolls 5" x 6".
1—10" x 10" 2-HIGH COLD MILL. Combination pinion stand and gear, extra forged steel rolls.
1—16" BAR MILL, 3-high, 4-stands, with speed reducer.
1—10" ROD MILL.
1—8" BAR MILL, 3-high.
1—REEL, 11" face x 17½" dia.
1—UNCOILER, cone type, 60" max. width coils.
1—RECOILER for 80" wide strip.
1—1500 TON STEAM HYDRAULIC FORGING PRESS.
1—34" x 192" ROLL GRINDER.
1—44" ROLL LATHE, enclosed headstock, tailstock, piano rest, 25 HP, 500-1500 RPM 230 volts, D.C. motor and controls.
3—65-TON ELECTRIC MELTING FURNACES, TOP CHARGE, with all electrical and mechanical equipment including 15,000 KVA and 13,333 KVA transformers.
1—ROLLER LEVELLER, McKay, rolls 80" face & 5½" dia. with gear box and universal spindles.
1—STRETCHER LEVELLER for sheets, 500,000 lb.
2—KANE & ROACH BAR AND ANGLE STRAIGHTENERS, Size #4, cap. 3" x 3" x ⅝" angles, 3½" channels and 2" bars.
3—UNITED HOT SAWS, 56", sliding frame.
1—UNITED #4 BAR SHEAR vertical open side.
1—156" x ¼" SHEET SQUARING SHEAR.
1—SLITTING SHEAR FOR SHEETS, Mesta 92".
1—HALLDEN FLYING SHEAR LINE, capacity 36" wide x 20 to 34 gauge x 15" to 144" long.
1—Tandem SLITTING AND CUT-TO-LENGTH LINE, heavy duty, max. opening for 38" wide.
1—WIRE DRAWING MACHINE, Aetna-Standard, 16" block, 5-unit.
1—MORGAN INGOT STRIPPER CRANE, 50' span, 200 tons capacity, 230 volts D.C.
1—ALLIANCE LADLE CRANE, 4 girders, 30 ton main hoist, 25 ton auxiliary, 55'5" span, 42' lift.
2—90-ton Treadwell HOT METAL TRANSFER CARS.
3—Blaw-Knox SLAG LADLE TRANSFER CARS.
1—CORRUGATING MACHINE, Stamco, for 12' wide sheets, including several sets of removable dies.
1—DRAWBENCH, Mesta, oil-hydraulic, for 3 strands of bars 20' long.
2—PICKLING MACHINES for sheets, Mesta.
2—60-TON CAPACITY HOLDING FURNACES, electric, each with 7500 KVA transformer.
2—PACK FURNACES for hot sheet mills 62" x 60" double chamber.
1—60" GALVANIZING LINE for sheets with 2 roller levellers.
1—3500 HP GEAR DRIVE, 514 to 80 RPM, 6.45 to 1 ratio.
1—3000 HP GEAR DRIVE, ratio 500 to 73.7 RPM.
1—3000 HP GEAR DRIVE, ratio 500 to 95.8 RPM.
1—1200 HP GEAR DRIVE, 353 to 94.6 RPM, 3.73 to 1 ratio.
2—35 HP SPEED REDUCERS, Falk 21 to 1.
1—3500 HP MOTOR, 11000 volts, 3 phase, 60 cycle, 514 RPM.
1—1200 HP MOTOR, 2200 volts, 3 phase, 60 cycle, 353 RPM.
1—50 HP MOTOR, G.E. frame MD-610-AE, 230 volts, 500 RPM.

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Cable: "Foster, Pittsburgh" **Telephone Atlantic 1-2780**

GUARANTEED **RE-NU-BILT**
ELECTRIC POWER EQUIPMENT
DC MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	8900	Elliott		475	320
1	2250	Elliott		600	200/300
1	2200	G.E.	MCF	600	300/360
1	1750	Elliott		250	175/350
1	1375	G.E.	MCF	415	1200
1	1200	G.E.	MCF	600	450/600
1	940	Whse.	QM	250	140/170
5	800	G.E.	MCF	250	400/750
8	450	Whse.		550	415
2	300	G.E.	MPC	230	400
2	200	Whse.	CB-207-4	250	850-1200
2	125	Whse.	SK-180	230	450-1200
1	150	G.M.	CDBB	600	250-700
1	150	Cr. Wh.	65-H	230	1150
1	125	Whse.	SK-185	230	350-1050
2	100	Whse.	SK-181	230	450-1000
1	60/100	G.E.	BF-17	230	450-900
1	75	G.E.	CD-1231	230	850
3	75	Cr. Wh.	53HTSFC	230	860
1	50	G.E.	MD-412-AE	230	550
6	40	Rel.BB	3053FTEFC	230	500-1500
1	30-40	Whse.D.P.	SK-131-5-BB	230	500-1500
3	unmused 30	G.E.	CDM-85-BB	230	2200

MG SETS—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	DC Volts	AC Volts
1	350	G.E.	900	125	4160-2300-440
1	2000	G.E.	514	600	2300-4600
3	1750/2100	G.E.	514	250/300	2500-4600
2	1000	G.E.	720	600	6600-13200
1	750	G.E.	720	125-250	2300-4600
1	500	Whse.	900	125-250	440
1	500	G.E.	900	125-250	440-2300
2	300	G.E.	1200	250	2300
1	250	Whse.	1200	275	2300
1	200	Wh. Ma.	1200	250	2300-4600
1	200	Whse.	1200	550	2300
1	200	G.E.	1200	250	440

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
8	3333	Whse.	OISC	1	13800 x 2500
1	1500	G.E. auto	HT	3	4800-4200-4400
8	1000	G.E.	HVDDJ	1	2400 x 480
8	1000	G.E.	OA/FA	1	13800 x 230/460
2	750	G.E.	Pyranol	1	4800 x 83/55
5	500	Kuhl	OISC	1	13200 x 6600
8	500	Moloney	OISC	1	6600/11430Y x 2300-4000Y
1	225	Marcus	Auto-air	3	208-220
Unused					
3	150	G.E.		1	83000 x 2300-4000Y
3	100	Whse.	OISC	1	4800-2300 x 460-230-115
8	100	G.E.	OISC	1	22900 x 2400-4160Y
Unused					

BELYEA COMPANY, INC.
47 Howell Street, Jersey City 6, N. J.

WORLD'S LARGEST STOCK
STAMPING PRESSES
SQUARING SHEARS • PRESS BRAKES
REBUILT *and* GUARANTEED

WILL LEASE WITH OPTION TO PURCHASE, OR **WILL FINANCE** OVER LONG TERM

JOSEPH HYMAN & SONS
Tioga, Livingston & Almond Sts.
Philadelphia 34, Pa. **Phone GArfield 3-8700**

AVAILABLE 3500 K.W. M.G. SETS SAVE $300,000

ALLIS-CHALMERS 3-Unit Sets
Each Consisting of:

(2)—1750-KW Generators 250/350-Volt parallel, 500/700 Volts series, 5000 amps., 514 R.P.M., separately excited fields, direct connected to a common 5000-HP Synchronous motor, 13,800/6900/4000-Volt, 3 phase, 60 cycle. The above rated continuous 40° C. class B insulation with enclosing covers, motor driven fan, for forced ventilation. Each set includes a direct connected 10-KW and 40-KW exciter.

These are of very late design with rolled steel frames, and were used very little.
Will furnish REBUILT, with A.C. and D.C. switchgear.
For additional information contact one of the following dealers closest to you.

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4300 Clarissa Street, Philadelphia 40, Pa.
Morehead Electrical Machinery Co.
120 Noblestown Road, Oakdale (Pittsburgh District) Pennsylvania
Brazos Engineering Co., Inc.
P. O. Box 9114, Houston, Texas
Duquesne Electric & Mfg. Co.
6428 Hamilton Avenue, Pittsburgh 6, Pa.

FOR SALE
COMPLETE BAR & ROD ROLLING MILL IMMEDIATELY AVAILABLE

Suitable for Rolling Steel or Copper billets down to bar or rod sizes, including hotbed, shears, and rod coiler.
STILL SET-UP, REASONABLY PRICED FOR IMMEDIATE SALE

NATIONAL MACHINERY EXCHANGE
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CAnal 6-2470

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CORAOPOLIS, PENNSYLVANIA
AMherst 4-1250
Dealers in new and used OET Cranes and Structural Steel Buildings.
Send us your inquiries.

UNIVERSAL
MACHINERY & EQUIPMENT CO.

MELTING FURNACES
3 KW AJAX Spark Gap Convertor
20 KW AJAX Melting Unit
50 KW INDUCTION FURNACE
333 KW AJAX Induction Furnace, 1,000 lb. Cap.
250 lb. LECTROMELT Arc Melting Furnace
1½ Ton LECTROMELT Arc Melting Furnace
1000 lb. SWINDELL Arc Melting Furnace
1½ Ton HEROULT Arc Melting Furnace

3 Ton Top Charge SWINDELL ARC FURNACE

HEAT TREAT FURNACES
1—LEE WILSON 150 KW, 5'6" x 8' I.D. Pit type
1—L.&N. 25 KW Homocarb Furnace
1—L.&N. 75 KW, 25" x 48" Electric Pit

CLEANING EQUIPMENT
PANGBORN 6' Type "LK" Rotoblast Table Room
36" Cont. AMERICAN Tumblast, 15 tons per hour
36 x 42 WHEELABRATOR w/skip loader
48 x 42 WHEELABRATOR w/skip loader
48 x 48 WHEELABRATOR w/skip loader

AMERICA'S LARGEST STOCK OF FOUNDRY EQUIPMENT

1630 N. NINTH ST., READING, PA.
Phone: FRanklin 3-5103

PLANER
60" x 60" x 16' SELLERS
4 Heads
"Power Flow"
50 H.P. D.C. Reversible Drive
100 H.P. M.G. Set
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3 spindle 28" Cincinnati-Bickford Upright Drill, m.d., No. 4 M.T.
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3 spindle Rockford 12" Gang Drill, m.d.
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6 spindle Model M1613 Pratt & Whitney In Line Vertical Drill
6 spindle W. F. & John Barnes Vertical Drilling Machine, m.d.
No. 924 Barnes Vertical Drilling, Boring, Facing & Reaming Machine
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10 ton capactiy P. & H. 3 motor cage operated, 96'-3" span, 230-VDC, 35' lift.

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15 ton capacity P. & H. 3 motor cage operated, 440-V., 3 ph., 60 cy., 45' C. to C. of ground rails, 15' overhang one end, 18' other end, bridge length 78' lift 40'.

Both available for immediate inspection and shipment.

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Steel By-Product Discs

2"	to 2½"	Diameter	x .060 to .125
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CLASSIFIED SECTION

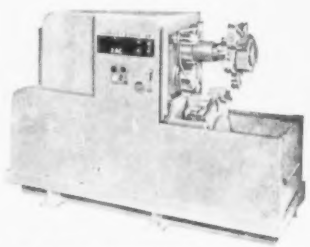
WARNER & SWASEY 2 AC AUTOMATICS

pay for themselves with one year's savings at Thew Shovel Company

PRODUCTION RECORD

PART	PART NAME	OLD TIME	NEW TIME	MONTHLY TURNOVER	% SAVINGS
	Pinion	.280 hours	.087 hours	100	69.0%
	Roller	.392 hours	.087 hours	2000	77.8%
	Sprocket	.376 hours	.177 hours	175	52.4%
	Roller	.373 hours	.126 hours	447	66.2%
	Roller	.372 hours	.141 hours	109	62.2%
	Spacer	.074 hours	.039 hours	770	47.2%
	Box	.431 hours	.193 hours	108	55.6%
	Box	.504 hours	.231 hours	36	54.0%

Cost savings from 47% to 77%! That's the production record of two Warner & Swasey 2 AC Automatics on small and medium lot work at Thew Shovel Company, Lorain, Ohio. Annual dollar savings exceed the cost of both machines plus tooling! On small and medium lot work these automatics can undoubtedly return substantial savings for you. To discuss their application to your work, call in our Field Engineer.



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8" or 10" Chuck—6" Working Stroke

2 AC CHUCKING MACHINE
10" or 12" Chuck—9" Working Stroke

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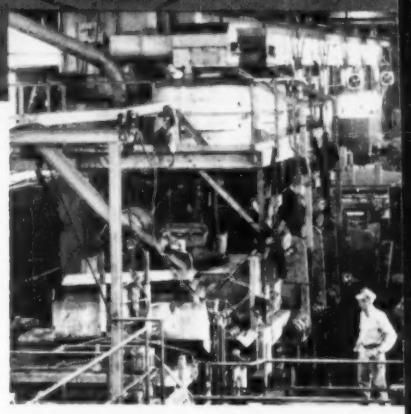

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Clean it fast with **Pangborn** *ROTOBLAST®*

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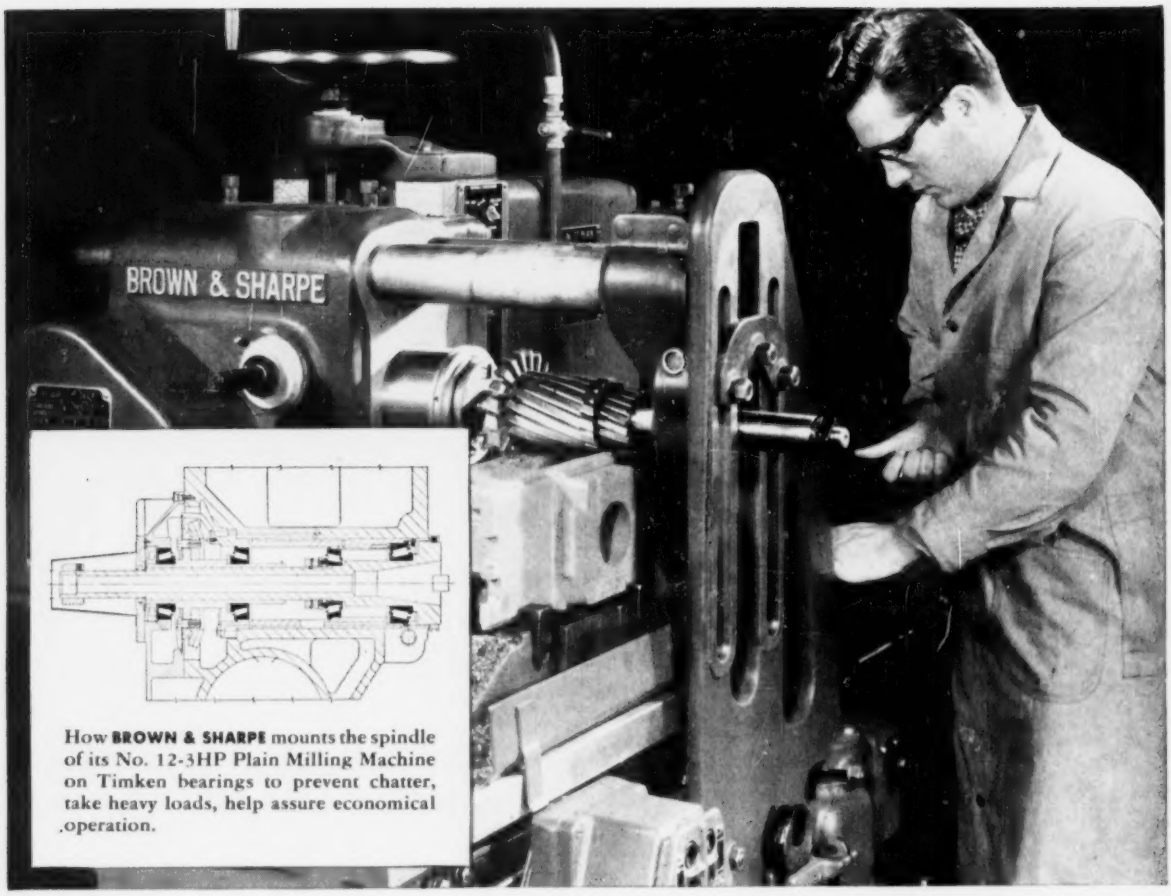
Manufacturers of Blast Cleaning and Dust Control Equipment



How **BROWN & SHARPE** mounts the spindle of its No. 12-3HP Plain Milling Machine on Timken bearings to prevent chatter, take heavy loads, help assure economical operation.

Climb mills both ways . . . TIMKEN® bearings prevent chatter in heavy cutting

TO make heavy cuts without chatter, Brown & Sharpe mounts the spindle of its No. 12-3HP Plain Milling Machine on two Timken® tapered roller bearings. For smooth power transmission, they use four Timken bearings in the bevel gear drive to the spindle. And to take climb milling's pulsating loads, two Timken bearings are used in the feed screw drive. Result—production milling is fast and accurate. Here's why.

• SPINDLE RIGIDITY MAINTAINED

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Rollers and races on Timken bearings are case-carburized to have a hard, wear-resistant surface over a tough, shock-resistant core. They take heavy loads and come back for more.

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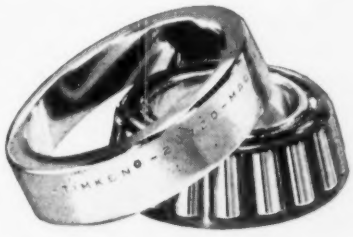
Timken bearings are geometrically designed to have true rolling motion and are precision-made to live up to their design. Practically friction-free, they last longer and run smoother. And to assure complete quality control, we even make our own electric furnace fine alloy steel. No other American bearing maker does. So for your No. 1 bearing value, always specify bearings trade-marked "TIMKEN". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



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